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LETTERS AND PAPERS

ON

AGRICULTURE, PLANTING, &c.

SELECTED FROM

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BATH SOCIETY PAPERS, &c.

On the ORIGIN *and* PROGRESS *of* AGRICULTURE *in different Ages and Nations.*

[*By* Mr. E. RACK, *Secretary to the Society.*]

THE wiſeſt governments have always regarded Agriculture as an object of the firſt magnitude and importance, and by various means encouraged and promoted it. With reſpect to ourſelves, the value of our acres is the grand ſource of national riches; and this value will ever bear an exact proportion to their cultivation and produce. The art of tilling, cultivating, and improving the earth, ſo as to render it fruitful, claims the precedency of all other arts in point of antiquity as well as dignity. It was man's original employment in the primæval ages of happineſs and peace. We are told by the Sacred Hiſtorian, that ADAM inſtructed his children in this art both by precept and example; and that CAIN applied himſelf to huſbandry, whilſt ABEL led the life of a ſhepherd, feeding his flocks. After the deluge had deſtroyed all the works of men, and ſwept away every veſtige of human art (except the Ark) from the face of the earth, we find it was the firſt care of NOAH and his deſcendants to revive the knowledge and practice of huſbandry, and to eſtabliſh them as the firſt means of obtaining happineſs and plenty in the various countries where they ſettled. This art was carried on with the greateſt ſimplicity in thoſe early ages; and it would be a curious ſpeculation to trace it through the ſlow and almoſt imperceptible gradations by which it has been brought to its preſent ſtate of perfection.

With reſpect to manures, we have little account (except in the Bible) of any being uſed before the eſtabliſhment of the Roman empire. In ſeveral of the Prophets we find mention is made of dung and dung-hills, in a manner which indicates that their uſe in fertilizing land was not wholly unknown. It is probable, that the inhabitants of thoſe ages which *immediately ſucceeded* the flood, knew not any method of reſtoring fertility to an exhauſted ſoil; and this opinion ſeems warranted by their frequently changing their ſituation, when the land they occupied failed in yielding its natural produce. We find that ABRAHAM, and the reſt of the Patriarchs, had no long-continued reſidence on one ſpot. They applied themſelves to a paſtoral life; and when their numerous flocks and herds had exhauſted the natural produce of one place, they removed to another; ennobling by their example a profeſſion or employment, which afterwards, for ſeveral ages, loſt its original dignity, by being confined to the lower claſſes of the people. Such was the happineſs and tranquillity enjoyed in this innocent employment, that it gave birth to the fineſt poetical imagery, and was celebrated under the peculiar diſtinction of the *Golden Age.*

But as ſoon as the deſcendants of ABRAHAM were ſettled in Paleſtine, they generally became huſbandmen, from the chiefs of the tribe of Judah to the loweſt branch of the family of Benjamin. High birth or rank did not at that time make any diſtinction, for agriculture was conſidered as the moſt honourable of all employments.

The Chaldeans, who inhabited the country where agriculture had its birth, carried that valuable art to a degree of excellence unknown in former ages. They cultivated their lands with great aſſiduity, and ſeem to have found out the means of reſtoring fertility to an exhauſted ſoil, or raiſing plentiful harveſts in ſucceſſion; on this account they were not obliged, as their predeceſſors had been, to change their ſituations, in order to obtain a ſufficiency for themſelves and their numerous flocks and herds of cattle.

The Egyptians, who, from the natural fertility of their country by the overflowing of the Nile, raiſed every year vaſt quantities of corn, were ſo ſenſible of the bleſſings reſulting from agriculture, that they aſcribed the invention of that art to Osiris. They alſo regarded Isis, their ſecond deity, as the diſcoverer of the uſe of wheat and barley, which before grew wild in the fields, and were not applied by that people to the purpoſes of food. Their ſuperſtitious gratitude was carried ſo far, as to worſhip thoſe animals which were employed in tillage; and even to the produce of their lands, as leeks, onions, &c.

The divine honours paid to Bacchus in India were derived from the ſame ſource, he being conſidered in that country as the inventor of planting vineyards, and the other arts attendant upon agriculture. It is alſo related of the ancient Perſians, on the moſt reſpectable authority, that their Kings laid aſide their grandeur once every month to eat with huſbandmen. The precepts of the religion taught by their ancient Magi, or Prieſts, included the practice of agriculture. The *Saint* among them was obliged to work out his ſalvation by purſuing all the labours of agriculture: and it was a maxim of the Zendaveſta, that he who ſows the ground with care and diligence, acquires a greater degree of religious merit, than he could have gained by the repetition of ten tho ſand prayers. The Phenicians, ſo well known in ſcripture by the name of *Philiſtines*, were alſo remarkable for their attention to, and ſkill in agriculture. But finding themſelves too much diſturbed and confined by the incurſions and conqueſts of the Iſraelites, they ſpread themſelves throughout the greateſt part of the Mediterranean iſlands, and carried with them their knowledge in the arts of cultivation.

MAGO, a famous General of the Carthaginians, is ſaid to have written no leſs than twenty-eight books on the ſubject; which COLUMELLA tells us were tranſlated into Latin by the expreſs order of the Roman Senate. SERVIUS confirms this account, and adds, that when VIRGIL compoſed his celebrated Georgics, he uſed theſe books as a model. We are informed by the ancient writers, that CERES was born in Sicily, where ſhe firſt invented the arts of tillage and of ſowing corn. For this eſſential ſervice, ſhe was, agreeable to the ſuperſtition of thoſe ages, deified, and worſhipped as the goddeſs of plenty. The truth of this is, that in the time of CERES, the iſland, through her endeavours and the induſtry of the people, became very fruitful in corn: And agriculture was there eſteemed ſo honourable an employment, that even their Kings did not diſdain to practiſe it with their own hands.

The deſcendants of NOAH, who ſettled in Europe, doubtleſs carried their knowledge of agriculture with them into the regions which they ſucceſſively occupied.—But thoſe who took poſſeſſion of Greece were ſuch an uncivilized race, that they fed on roots, herbs, and acorns after the manner of beaſts. PELASGUS had taught them the culture of the oak, and the uſe of acorns as food, for which ſervice we are told divine honours were paid him by the people. The Athenians, who were the firſt people that acquired any tincture of politeneſs, taught the uſe of corn to the reſt of the Greeks. They alſo inſtructed them how to cultivate the ground, and to prepare it for the reception of the ſeed. This art, we are told, was taught them by TRIPTOLEMUS. The Greeks ſoon perceived that bread was more wholeſome, and its taſte more delicate, than that of acorns and the wild roots of the fields; accordingly they thanked the Gods for ſuch an unexpected and beneficial preſent, and honoured their benefactor. HESIOD, who is generally thought to have been contemporary with HOMER, was the firſt we know of among the Greeks who wrote on this intereſting ſubject. XENOPHON has alſo, in his Œconomics, remarked, that Agriculture is the nurſing mother of the arts. For, ſays he, "where Agriculture ſucceeds proſperouſly, there the Arts thrive; but where the earth neceſſarily lies uncultivated, there the other arts are deſtroyed." The other eminent Greek writers upon agriculture were, DEMOCRITUS of Abdera, SOCRATICUS, ARCHYTAS, TARENTINUS, ARISTOTLE, and THEOPHRASTUS, from whom the art received conſiderable improvements; as it did alſo from HIERON, EPICHARMUS, PHILOMETOR, and ATTALUS.

The old Romans eſteemed agriculture ſo honourable an employment, that in the earlieſt times of the Republic, when patriotiſm was more than an empty name, the higheſt praiſe that could be given a man was to ſay of him, that he had well cultivated his ſpot of ground. The moſt illuſtrious ſenators of the empire, in the intervals of publick concerns, applied themſelves to this profeſſion; and ſuch was the ſimplicity of thoſe ages, that they aſſumed no appearance of magnificence and ſplendour, or of majeſty, but when they appeared in publick. At their return from the toils of war, the taking of cities, and the ſubduing of hoſtile nations, their greateſt Generals were impatient till they were again employed in the arts of cultivation. They thought it no diſgrace to follow the plough, although they were at the ſame time prepared to ſerve the wants of the Republick in every department of the government, to attend her councils, or to put themſelves at the head of her victorious legions.

REGULUS, a celebrated Roman commander, when in Africa, requeſted of the Senate to be diſmiſſed, leſt his *farm* might ſuffer for want of proper cultivation in his abſence; and the Senate wrote him for anſwer, that it ſhould be taken care of at the publick expence, while he continued to lead their armies. CICERO expreſſed an high opinion of the good effects of an agricultural life on the manners and conduct, in his work *de Senectute, & pro L. Roſcio Amerino.* And STRABO tells us, that thoſe who practiſed agriculture in India, were the moſt moral and juſt of any ranks of the people. CATO the Cenſor, that illuſtrious Roman general, politician, and lawyer, did not think it below his dignity to write a treatiſe on agriculture. VARRO compoſed a treatiſe on the ſame ſubject, and on a more regular plan. VIRGIL, who lived about the ſame time, has adorned this ſubject with the language of the Muſes, and given it inexpreſſible grace, beauty, majeſty, and dignity, by his verſe: in his Georgics, he has finely embelliſhed the precepts and rules of huſbandry left by HESIOD, VARRO, and MAGO. COLUMELLA, who flouriſhed in the reign of the Emperor CLAUDIUS, wrote twelve books on huſbandry, replete with important inſtruction: he was a native of Bœotia in Spain, and had devoted the principal part of his time to the ſtudy of agriculture. This art received likewiſe great improvement from the two SAFFERNÆ, SCORFA, TREMELLIUS, and TIRENTIUS. PALLADIUS alſo wrote ſeveral treatiſes on the ſame ſubject.

But to return to our own country. We are very much in the dark with reſpect to the ſtate and progreſs of agriculture in Great-Britain previous to the fourteenth century. That it was pretty generally practiſed, eſpecially in the eaſtern, ſouth, and midland parts of England, is certain; but of the mode, and the ſucceſs, we are left almoſt totally ignorant. In the latter end of the ſixteenth century, however, it ſeems to have been cultivated as a ſcience, and received very great improvement. At this time our countryman FITZHERBERT, judge of the Common-Pleas, ſhone forth with diſtinguiſhed eminence in the practical parts of huſbandry. He appears to have been the firſt Engliſhman who ſtudied the nature of ſoils, and the laws of vegetation, with philoſophical attention. On theſe he formed a theory confirmed by experiments, and rendered the ſtudy pleaſing as well as profitable, by realizing the principles of the ancients, to the honour and advantage of his country. Accordingly, he publiſhed two treatiſes on this ſubject; the firſt, entitled "*the Book of Huſbandry*," appeared in 1534; and the ſecond, called "*the Book of Surveying and Improvements*," in 1539. Theſe books, being written at a time when philoſophy and ſcience were but juſt emerging from that gloom in which they had long been buried, were doubtleſs replete with many errors; but they contained the rudiments of true knowledge, and revived the ſtudy and love of an art, the advantages of which were obvious to men of the leaſt reflection.

About the year 1600, France made ſome conſiderable efforts to revive the arts of huſbandry. And nearly in the ſame period, the *practice* of huſbandry became more prevalent among this people and the Flemings than the publiſhing of *books* on the ſubject. Their intention ſeemed to be that of carrying on a private lucrative employment, without inſtructing their neighbours. Whoever therefore became deſirous of copying their method of agriculture, was obliged to viſit that country, and make his own remarks on their practice. The principal idea they had of huſbandry was, by keeping the lands clean and in fine tilth, to make a farm reſemble a garden as nearly as poſſible. When they had by this method brought the ſoil to a proper degree of cleanlineſs, health, and ſweetneſs, they chiefly cultivated the more delicate graſſes, as the ſureſt means of obtaining a certain profit upon a ſmall eſtate, without the expence of keeping many draught horſes and ſervants. A few years experience was ſufficient to convince them, that ten acres of the beſt vegetables for feeding cattle, properly cultivated, would maintain a larger ſtock of grazing animals, than forty acres of common farm graſs on land badly cultivated. They alſo found, that the beſt vegetables for this purpoſe were lucerne, ſainfoin, trefoil of moſt kinds, ſweet fenugreek, buck and cow-wheat, field turnips, and ſpurrey. They are ſaid to have diſcovered nine ſorts of manure, but what they all were, we are not particularly informed. We find, however, that marle was one of them.

At the cloſe of the grand Rebellion, TUSSER, PLATT, PLATTES, HARTLIB, BLYTHE, and ſome others, publiſhed ſome writings, which have been equalled by few in later times. This revival of the art of huſbandry received very conſiderable encouragement from CROMWELL himſelf. Sir HUGH PLATT was one of the moſt ingenious huſbandmen of the age in which he lived. Perhaps no man in any age diſcovered, or at leaſt brought into uſe, ſo many new kinds of manure. This will be evident to thoſe who read his account of the compoſt and covered dung-hills, and his judicious obſervations on the fertilizing qualities lodged in ſalt, ſtreet-dirt, and the *ſullage* of ſtreets in great cities, clay, fuller's-earth, mooriſh earths, dung-hills made in layers, fern, hair, calcination of all vegetables, malt-duſt, willow-tree earth, ſoaper's aſhes, urine, marle, and broken pilchards.

During the reign of the ſecond CHARLES, when vice and folly were purſued to the excluſion of almoſt every thing ſerious and truly intereſting; EVELYN was the firſt writer who inſpired his countrymen with a deſire of reviving the ſtudy of agriculture. He was followed by the famous JETHRO TULL. And their joint labours opened a new and extenſive ſphere for the minds of mankind to range in.

About the middle of the laſt century, Ireland began to make a conſiderable figure in the art of huſbandry. In proof of which, it will be ſufficient to obſerve, that the tranſctionas of the Dublin Society for encouraging huſbandry are cited by all foreigners, in their memoirs relating to that ſubject.

During the hurry and diſtreſſes of France in the war of 1756, conſiderable attention was paid to agriculture.—They felt the effects, and ſaw the neceſſity of promoting it. Prize queſtions were annually propoſed in their rural academies, particularly thoſe of Lyons and Bourdeaux; and many judicious alterations were made by the Society for improving agriculture in Britanny. About this time vigorous exertions began to be made in Ruſſia to introduce the moſt approved ſyſtem of huſbandry which had taken place in other parts of Europe. The art of agriculture has alſo been for near thirty years publickly taught in the Swediſh, Daniſh, and German Univerſities. The Neapolitans of this age have condeſcended to recur to the firſt rudiments of revived huſbandry, and begun to ſtudy anew the Agricultural Syſtem of CRESCENZIO, firſt publiſhed in 1478. The people of Bergamo have purſued the ſame plan, and given a new edition of the *Ricordo d' Agriculture de Tarello*, firſt publiſhed in 1577. The Duchy of Tuſcany have, to their honour, imbibed the ſame ſpirit for improvement;—a private Gentleman, about forty years ſince, left his whole fortune to endow an Academy of Agriculture; the firſt Eccleſiaſtick in the Duchy is preſident of this ſociety, and many of the chief of the nobility are members. In Poland, where a natural fertility of ſoil ſeems to diſpenſe with the neceſſity of calling it in the aid of improvements, M. De Bieluski, Grand Marſhal of the Crown, has made many ſucceſsful attempts to introduce the new huſbandry among his countrymen; and procured the beſt inſtruments for that purpoſe from France, England, and other parts of Europe.

In the year 1759, a few ingenious and publick-ſpirited men at Berne in Switzerland eſtabliſhed a Society for the advancement of agriculture and rural œconomics. Nor muſt we here omit to mention, that the juſtly-celebrated Linnæus and his diſciples have performed great things in the North of Europe, particularly in diſcovering new kinds of profitable and well-taſted food for cattle. And the King of Denmark ſent three perſons into Arabia Felix to make remarks, and bring over ſuch plants and trees as would be uſeful in huſbandry, building, and rural affairs. The Duchy of Wirtemburgh alſo, a country by no means unfertile, but even friendly to corn and paſturage, has contributed its aſſiſtance towards the improvement of agriculture, having more than thirty years ſince publiſhed fourteen œconomical relations at Stutgard. Even Spain invited Linnæus, with the offer of a large penſion, to ſuperintend a college founded for the purpoſe of making new enquiries into the Hiſtory of Nature and the Art of Agriculture. But, without any improper partiality to our own country, we are fully juſtified in aſſerting that England alone exceeds all modern nations in huſbandry.

Among the valuable books on the ſubject may be reckoned, the works of Lord Kaimes, Mr. Young, Stillingfleet, Doctors Hunter, Ellis, Randal, Lisle, Clarke, Marshal, Mortimer, Baker, Varley

HARTE, DUHAMEL, BRADLEY, KENT, DE TURBILLY, MILLS, and others. The Muſeum Ruſticum, the Farmer's Dictionary, and the Farmer's Magazine, each contain detached pieces of acknowledged merit.

May 20, 1783. E. R.

PROPOSAL *for the further* IMPROVEMENT *of* AGRICULTURE.

[*By the Rev.* WILLIAM LAMPORT.]

A Country will be cultivated only in proportion as its inhabitants advance in civilization. Nations will not begin to civilize themſelves, till they ceaſe migrating from place to place: neither will a man attempt to cultivate any ſpot, 'till he can ſay THIS IS MINE. Property, therefore, muſt be gained and defined, ſettled and ſecured. Theſe are circumſtances on which the advancement, if not the very exiſtence, of agriculture depends. If we expect to find agriculture in a thriving ſtate before the Reformation, we ſhall be diſappointed: it was indeed conſidered of importance; but *the fruit of a man's labour was not ſecured to him; and the nation was immerſed in groſs ignorance.* Even after the Reformation, although many of the arts and ſciences were cultivated with peculiar ſpirit, Agriculture did not receive encouragement proportioned to its great importance. A new world had been diſcovered, which opened the brighteſt proſpects to theſe kingdoms, and the attention of England was fixed chiefly on trade and commerce. This circumſtance, which for a while appeared to be a principal impediment to huſbandry, and was the cauſe of little attention being paid to FITZHERBERT, proved in the event one of its principal promoters. By commerce, the various productions of different parts of the earth have been brought into this kingdom, and intruſted to the care of the ſkilful botaniſt and gardener; who, having naturalized them to this climate, commit them to the care of the huſbandman. In return, agriculture has ever ſince been aſſiſting commerce in the increaſe of corn, hemp, flax, madder, &c.; and in proportion as both have been attended to, it is evident they have mutually aſſiſted each other. But as improvements prevailed, the importance of huſbandry, in a national view, became daily more and more conſpicuous;—the diſadvantages and impediments it met with, under the management of common farmers, began likewiſe to appear. The weeds ſprang up with the wheat, and ſkill was wanting to prevent this evil. To check theſe weeds, by enlarging the views of thoſe intended for the profeſſion of Agriculture, was the noble attempt of the great MILTON, who not only recommended, but eſtabliſhed, a ſchool, in which rural œconomics were to bear a principal part in his ſyſtem of education. His pupils were to read the works of Cato, Varro, Columella, &c. on agriculture. But unhappily, his loſs of ſight prevented him from realizing in practice, what he had ſo judiciouſly adopted in theory. That EVELYN, one of the moſt uſeful men of the age in which he lived, entertained the ſame ſentiments as Milton, appears from the preface to his Sylva.

Mr. COWLEY recommended a College to be erected in each Univerſity, and the appointment of profeſſors for the inſtructing of young perſons in the principles and *practice* of this uſeful employment. But, as it is always the fate of the moſt uſeful deſigns to meet with difficulties at the beginning, agriculture itſelf began, ſoon after, to fall from its flouriſhing ſtate into national diſregard. Such was its ſtate during the reign of that gay prince CHARLES II.; agriculture muſt ſeverely ſuffer, in an age ſo deeply immerſed in luxury, pride, and diſſipation; eſpecially if it be conſidered that the perſons who paid the cloſeſt attention to it, had "crept into the confiſcated eſtates of the nobility, gentry, and clergy," and were many of them originally in very inferior ſtations. The miniſtry, after the Reſtoration, permitted the exportation of wheat; which increaſed *tillage*, but did not improve *the mode of culture*. Agriculture fell into diſrepute; but EVELYN, in the midſt of this general indifference, publiſhed in the year 1675, his *Terra*, or a *Philoſophical Diſcourſe on Earth*. The next writer we ſhall mention is Lord MOLESWORTH, who, in his *Conſiderations for promoting of Agriculture, and employing the poor*, makes the following judicious remarks, "As to agriculture, I would humbly propoſe that a *ſchool for huſbandry* ſhould be eſtabliſhed in every county, wherein a maſter well ſkilled in agriculture ſhould teach at a fixed yearly ſalary: and that TUSSER's old book of huſbandry ſhould be taught the boys to read, to copy, and get by heart; for which purpoſe it might be reprinted."

After this, ſeveral Gentlemen (the leader of whom was the famous TULL) took their eſtates into their own hands, and cultivated them with 'ſpirit, taſte, and ſenſe,'—by regulating the courſe of crops according to the nature of the ſoil—by baniſhing waſteful fallows—by deſtroying weeds—by ſtirring and pulverizing the earth while a crop was growing, and thereby preparing it for the immediate reception of a ſucceeding one—by introducing new plants for the better ſupport of man and beaſt in winter as well as in ſummer, &c. But, unhappily, theſe capital improvements remained for a long time within the circle of thoſe farms where they originated, or thoſe counties where ſuch publick ſpirited gentlemen had ſet the example by their own practice. Theſe modes of cultivation were novel; on *this* account they were ſlighted, if not derided. Then followed the eſtabliſhment of a Society in London for the encouragement of Agriculture, &c. who, by beſtowing large premiums for the greateſt crops on given quantities of ground, effectually ſecured the farmer under any riſque he might run. It was naturally imagined this would have anſwered the end propoſed. But if we may determine from Mr. BAILY's regiſter of the perſons to whom premiums have been adjudged, moſt of the candidates have been far above the rank of common farmers. However, the advantages ariſing from that excellent inſtitution excited and eſtabliſhed others of a ſimilar nature, in counties remote from the metropolis; each of which hath thrown additional light on the ſubjects of agriculture.

Every one who reflects juſtly muſt be ſenſible, that it is with agriculture as with phyſic. While facts and experiments are producing and increaſing the beſt knowledge, it is neceſſary that thoſe who may hereafter engage in either of the profeſſions, be inſtructed in the firſt principles of the one, and the practice of the other. Agriculture is a ſcience as well as an art; and ſome general ſcientific knowledge is requiſite before that art can be practiſed with any rational hope of full ſucceſs; unleſs quacks may be allowed to perform perfectly well in agriculture, although they are continually breaking the ſixth commandment in phyſick. Mr. YOUNG indeed obſerves, that "experience is an admirable foundation for any kind of ſtructure; but in agriculture ſhe muſt be the ſtructure itſelf, not the foundation." No one will pretend to deny that experiments are the life and ſoul of huſbandry,—but they muſt not be made at random; for to what can ſuch experiments tend, except to the frequent diſappointment of the farmer, and to the publick loſs? The *difficulty* of inſtituting Schools for Huſbandry is now trifling, ſince ſo many Societies have been eſtabliſhed, and are ſupported with ſo much liberality; eſpecially ſince the *Society of Arts, Manufactures, and Commerce*, is annually offering ſuch vaſt ſums of money for the encouragement of experiments.—Were Schools eſtabliſhed in different parts of the kingdom for the education of farmers' ſons who might be but in low circumſtances, gentlemen would never want ſenſible and rational improvers of their eſtates, who would likewiſe be the moſt proper perſons to inſtruct pariſh apprentices and inferior ſervants. This old-experienced VARRO reckoned to be of principal importance. 'The bailiffs', ſays he, 'ſhould be men of ſome erudition and ſome degree of refinement.' But more eſpecially ought a bailiff to be *well ſkilled* in rural œconómics: he ſhould not only give orders, but alſo work himſelf; that the labourers might imitate him, and be convinced it is with propriety he preſides over them, becauſe he excels them in the practical part, as well as the ſcientific.—Were ſome ſmart boys ſelected by each Society, and educated on the above plan, they would hereafter convey knowledge wherever they went; and their obſervations would be better attended to by inferior ſervants, than if they came from perſons of high rank. In ſhort, *they* would effect what even the ſuperior knowledge of noblemen and gentlemen could not perform, who have more important objects in view than to cultivate the neglected underſtanding of every ruſtic labourer they may have occaſion to employ. Like ſmaller rivulets, branching from the main ſtream, they would water and fertilize thoſe lands where a larger river cannot with propriety expand itſelf. While under tuition, they will learn the expediency of a clean and ſpirited ſyſtem of huſbandry; as it is ſuppoſed that their tutor's fields will be cultivated on theſe principles. On comparing his crops with thoſe of many others, the truth of HESIOD's maxim would be apparent, that *half may be more than the whole.* For ſhould they think of becoming tenants, they will view an eſtate with this ruling principle, that one of an hundred pounds per annum, well cultivated, will produce, at the end of the term, more clear profit than another of two hundred a year, treated in a negligent and ſlovenly manner.

Such an inſtitution as is here recommended may poſſibly be of ſervice to thoſe farmers who have no particular connection with our Agricultural Societies; whoſe fields, however, lying open to the continual view of their neighbours, will be a conſtant leſſon to thoſe who moſt need inſtruction, ſpeaking much more intelligibly to *them* than accounts of experiments ſtated on paper; againſt which they will be frequently ſtarting that particular kind of doubt, which I have found to be generally expreſſed in ſome ſuch language as this, *It may be ſo, but I don't know.*—The advantages of ſuch an Academy for the education of Gentlemen's ſons will be no leſs evident with regard to themſelves, their poſterity, and the nation in general. Time is precious, and might be virtually lengthened by a proper diſpoſal of it. When the mind is fatigued with cloſe application, exerciſe in the open air will renew its ſtrength and activity. Additional to their being taught the value of the different fields over which they may walk with their tutor, from the various plants each field naturally produces, Botany may be attended to as a pleaſing and inſtructive ſcience; neither ſhould planting and gardening by any means be neglected; nor the art of ſurveying and delineating eſtates be conſidered as beneath their notice. In bad weather they may be occaſionally amuſed with experiments on various branches of natural philoſophy;—the effects of the air with regard to vegetation, and the nature of different earths and manures, after the manner of the Doctors HOME, FORDYCE, AINSLIE, PRIESTLEY, &c. They ſhould alſo be inſtructed in the principles of Mechanics, eſpecially that which relates to Hydraulics, it being of principal utility in draining and other modes of improving eſtates.

Having gained ſome knowledge of Agriculture, they will read the works of the ancient agricultural writers with improvement and pleaſure; a circumſtance which will much expedite the knowledge of the languages. For without excluding other proſe authors, may I not venture to aſſert, that the ancient writers on huſbandry are, from the nature of their ſubject and their claſſical ſtile, as proper for young perſons, and as ſuitable to their diſpoſitions and capacities, as any they generally read?

Engaging in rural concerns will ſtrengthen the whole human frame, the powers of the mind, as well as the members of the body; will give a manly turn to thought, duly regulated and refined by polite literature. A perſon thus educated will never want a variety of entertainment in the country to fill up his time in a manner equally innocent, rational, and uſeful.

When our young pupil ſhall come to the poſſeſſion of his paternal eſtate, he will immediately perceive what is to be done to the beſt advantage; he will be able to *direct* his ſervants, rather than be *impoſed* upon by them, which muſt ever be the caſe when the maſter is unacquainted with the buſineſs he ſuperintends. This is a matter of high importance. For if in any other profeſſion he ſhould ſpend his fortune, it is poſſible he may be the *only* ſufferer; but it is not ſo in Agriculture. Every field is, in ſome reſpect, public property; and if his crops fail through unſkilful management, whatever is loſt by the owner is, in ſome degree, a loſs to the community at large.

Indeed I cannot conſider the ſtudy and profeſſion of Agriculture as any way unbecoming the character of a Clergyman; he may hereafter prove of great ſervice to his country pariſhioners, as his advice and method of proceeding would be readily attended to by the younger part of his pariſhioners, and he will have frequent opportunities of conveying juſt ideas of improving their modes of cultivation. Should his cure be but ſmall, he will have a fair opportunity of preſerving himſelf from that dependance, which might too often leſſen the weight and energy which ſhould always accompany his religious inſtructions.

Sir WILLIAM PETTY, in his *Advice for the advancement of Learning*,[*] propoſes, "That there be inſtituted literary work-houſes, where children may be taught as well to do ſomething towards their living as to read and write.

"That the buſineſs of education be ſeriouſly ſtudied and practiſed by the beſt and ableſt perſons.

"That all children, above ſeven years old, may be preſented to this kind of education; none being excluded by reaſon of the poverty and inability of their parents; for hereby it hath come to paſs, that many are now holding the plough, who might be made fit to ſteer the ſtate.[†]

"That all children, though of the higheſt rank, be taught ſome genteel manufacture, in their minority, or turning of curious figures, &c. limning and painting on glaſs or in oil colours, botanics and gardening, chemiſtry, &c. &c.

"And all for theſe reaſons:—They ſhall be leſs ſubject to be impoſed upon by artificers; they will become more induſtrious in general; they will certainly bring to paſs moſt excellent works, being, as gentlemen, ambitious to excel ordinary workmen. They, being able to make experiments themſelves, may do it with leſs charge and more care than others will do it for them. It may engage them to be Mæcenas's and patrons of arts. It will keep them from worſe occaſions of ſpending their time and eſtates. As it will be a great ornament in proſperity, ſo it will be a great refuge and ſtay in adverſity and common calamity."

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[*] Publiſhed in 1648.

[†] Cincinnatus was called from the plough, in order to ſteer the ſtate as Dictator; and returned to it again after he had delivered Rome from her danger.

On the Improvements in Agriculture that have been ſucceſsfully introduced into this Kingdom within the laſt Fifty Years.

[*By* J. Wimpey, *Esq; of North-Bockhampton.*]

BY improvements in agriculture, I underſtand ſuch an artificial management in the culture of land, as may increaſe the value of its produce *more* than in proportion to the expence which has been incurred in procuring ſuch increaſe; or, in other words, Improvements conſiſt of, and are eſtimated by, the increaſe of nett profits or gain, acquired by means of art and ſuperior management uſed in the cultivation of land. The means of ſuch improvements, I conceive, may be fitly claſſed or arranged under the following general heads, viz.

1. Improvements in the art of tillage.
2. In the invention of new implements, or improvements of thoſe in uſe before.
3. In the quantity of ſeed moſt proper to be ſown, and in the regular diſtribution of the ſame both as to diſtance and depth.

4. In ſuiting the crop to the nature and condition of the ſoil.

5. In the rotation, or moſt beneficial ſucceſſion of crops.

6. In manures, natural and artificial.

7. In the ſucceſsful introduction of many new articles into field culture.

8. In the advantages of applying them to rearing and fattening cattle, &c. &c.

Of Improvements in Art of Tillage.

Tillage conſiſts in breaking, crumbling, and pulverizing the ſoil. Improvements which have been made in tillage are of very great importance, as it may truly be ſaid to have been the baſis or real foundation on which the ſucceſsful introduction of all the new articles of field culture depend, as will clearly appear hereafter, when we treat particularly of thoſe articles. When the ground is well tilled, it is in the moſt perfect condition for receiving the fertilizing principles of the atmoſphere. Rain, ſnow, hail, dews, and hoar froſt, &c. convey the nutriment of vegetation, which floats in the air, moſt plentifully into the boſom of the earth, as deep as it has been broken, and well pulverized; which it imbibes very freely, and incorporates thoroughly therewith. It is the only effectual means of deſtroying weeds, ſo neceſſary to the beneficial growth of all crops, and ſhould be repeated till they are in a great meaſure deſtroyed; which, by being continually expoſed to the ſun and wind, will be much ſooner than can be effected by any other means. The deſtroying of weeds, however, is not the only immediate benefit accruing from a due ſtate of tillage; grubs, beetles, worms, and maggots of many different kinds, which abound in many fields, may be greatly diminiſhed, if not entirely extirpated and deſtroyed, by the well-timed uſe of the plough, and its auxiliary inſtruments neceſſary to the reduction and due pulverization of the ſoil. Nothing ſo effectually prevents the ravages of the ſeveral tribes of ſubterraneous inſects, as the frequent ſtirring and crumbling the ground.

The improvement the ſoil acquires by means of frequent and well-timed tillage, is gradual and progreſſive, and the longer it is kept in tillage, if duly performed, the more fertile it becomes. One ploughing in the beginning of winter, and a ſecond in the winter, or early in the ſpring, will be more effectual in pulverizing and fertilizing the ſoil than half a dozen at any other time of the year.

Of the Invention of new Implements of Huſbandry, or Improvements in the old.

This article comprehends ploughs of every denomination, drags, harrows, horſe and hand hoes, machines and implements which have been invented to perform the ſeveral operations of huſbandry in a more perfect manner, and with leſs trouble and expence.

In former times ploughs were very ill-conſtructed; ſome little more than ſcratched the ground, others were made ſo heavy and clumſy as to require great ſtrength to work them. Leſs than four horſes could do nothing with them. There are now ſeveral in uſe which perform much better, viz. the *Rotheram* or *patent plough*, the *one-wheeled plough*, and the *Norfolk plough*, which I believe is the laſt, and, it is ſaid, by much the beſt in uſe; as it will plough up ſtrong land with two horſes only, a man, and no driver; ſo that it does as much work and quite as well as the heavy two-wheeled plough, which requires four horſes, a man, and driver; being double the expence of the Norfolk plough for the ſame quantity of work.

There is another plough in uſe, which, it is ſaid, does twice the work of this in the ſame time, at a little more expence; that is, the *Double Plough*, which ploughs two furrows in the ſame time any other does one. There are others of a more modern invention uſed for particular purpoſes, of which that with two mould-boards is a valuable invention. With this plough I make the open furrows for planting potatoes, and then compleatly cover the ſets by ſplitting the ridges. When they have been horſe-hoed, it again ſplits the ridges in the intervals, and earths up the plants.

There are other ploughs of leſs general uſe, ſuch as the trenching-plough, and a ſmall light plough for ploughing the intervals of drilled crops, which may either be in the form of the Rotherham plough, or the one-wheeled plough, either of which would anſwer the purpoſe as effectually as any horſe-hoe whatever.

Of the Quantity of Seed most proper to be sown; and on the regular distribution of the same, both as to distance and depth.

The improvement made by the great ſaving of ſeed in modern practice is very great. It is very certain from experiments, moſt ſatisfactorily authenticated, that about one-third of the ſeed which was formerly uſed, and indeed is ſtill in moſtplaces, is fully ſufficient. In general it produces a better crop than the whole quantity. In the old huſbandry or broad-caſt method of ſowing, it is uſual to allow from two to three buſhels of ſeed-wheat, as the ſeaſon happens, to a ſtatute acre; but in drilling or ſetting, as practiſed in the Eaſtern counties, it is found that from three to five pecks is quite ſufficient; ſo that the difference between the two modes of planting amounts, at leaſt, to a ſaving of one buſhel and a half per acre. If then theſe new modes of planting all ſorts of grain were equally adopted, the ſaving, I conceive, would be an addition to the year's produce, a tenth or twelfth of its whole amount. The farmer, therefore, who in any one year might plant one hundred acres of wheat in the new method, would ſave at leaſt one hundred and fifty buſhels of ſeed. If the ſaving of ſeed then on one hundred acres would be one hundred and fifty buſhels, how amazing would be the amount of the quantity ſaved on all the tillage lands of Great-Britain! This is a very intereſting object to individuals, and in a national view one of exceeding great importance. It would, therefore, be very patriotick to uſe every means to promote and extend the practice.

This improvement in planting has all the prejudice of the common farmer to contend with. He has been uſed, perhaps, almoſt half a century, to ſow his land with wheat at the rate of two buſhels and a half per acre, and at harveſt too frequently has obſerved he has not half a crop; from which he haſtily concludes, that if he had ſown but half the quantity, ſmall as his crop was, it would have been but half as great. His land is frequently in very imperfect tilth, very rough, and full of large lumps; however, the ſeedſman ſcatters the ſeed on the ſurface, and in harrowing, a part is covered ſo deep as never to appear, another is never covered at all, but is picked up by the birds; ſo that it frequently happens that not one-third of the ſeed ever vegetates and arrives at maturity. But in planting by hand, every corn is placed at the intended depth and diſtance, and not one in a thouſand miſcarries. The only objection which can be made to it is the expence of ſetting it, and the great number of hands it requires; more indeed than can at any rate in many places be procured. The principal objection is obviated by the many inſtruments lately invented for ſowing the ſeed very regularly at any required depth and diſtance, either in cloſe drilling to be hand-hoed, or in open drilling with intervals of a proper width for horſe-hoeing.

Of suiting the Crop to the Nature and Condition of the Soil.

In former times the farmer was governed more by the price a commodity would yield at market, than by the conſideration of what the nature and quality of his land was beſt adapted to produce. But experience, and the introduction of many new articles into field culture, have given him a much larger field to range in; and now a ſenſible farmer regulates his practice by the conſideration of what his land is ſuited to produce a large and profitable crop of, without too great trouble and expence.

The Rotation or most beneficial Succession of Crops

Comprehends improvements of great magnitude and extent. The articles of culture are commonly divided into two claſſes, viz. One conſiſts of crops that are ſaid to exhauſt and impoveriſh the land they grow on; the other to ameliorate and improve it. This muſt be underſtood in a comparative ſenſe; for, properly ſpeaking, there are few if any vegetables that are carried off the land they grow on to be conſumed elſewhere, but in ſome meaſure exhauſt and impoveriſh the ſoil, and render it leſs fertile.

The firſt claſs, viz. thoſe which are ſuppoſed to exhauſt the land moſt, are fibrous-rooted plants, as wheat, barley, rye, oats, &c. The ameliorating includes all the legumenous and tap-rooted plants, as beans, peaſe, vetches, turnips, parſnips, carrots, clover, &c. Modern improvements are much increaſed by a judicious ſucceſſion of interchanges among thoſe articles. An ameliorating following an exhauſting crop prepares the land for another exhauſting crop, and eſpecially if it be a hoeing crop; for by judicious management the land may be conſtantly cropped for many years in ſucceſſion.

Of Improvements by Means of Manures both Natural and Artificial.

Manures may be divided into thoſe that act mechanically, and thoſe that act chemically. The ſubſtances which increaſe the fertility of land by mechanical means, are all thoſe which by mere addition and intimate commixionve its texture. Thus ſtrong, wet, heavy clay, by the mere addition of ſharp ſand, or fine gravel, may be opened, rendered more light and porous, and conſequently much more fertile. And light ſandy and gravelly ſoils, whoſe open, looſe, incoherent texture ſuffers the rain, dews, &c. ſuddenly to paſs through them, are much improved by the addition of ſtrong binding loams or clay, which render its texture more coherent and productive of vegetable nouriſhment. Among theſe may be reckoned marles of all kinds, chalk, ſhells, and indeed every kind of ſubſtance, which, merely by its texture, has the property of rendering ſoils that are too adheſive, cloſe, and heavy, more light, open, and porous; and thoſe that are too looſe and incoherent, more denſe, conſiſtent, and retentive of whatever is added to it intentionally by way of improvement, or happens adventitiouſly in the courſe of nature. But marles, chalk, ſhells, &c. properly ſpeaking, are improvers of the ſoil, not merely as they correct and amend the texture, but alſo by their chemical powers, which produce an increaſe of vegetable nouriſhment, and give fertility to the ground. So that they act in a double capacity, that is to ſay, both mechanically and chemically.

The atmoſphere is the grand magazine, the great receptacle of putrid vapours, which are conſtantly exhaled and flying off from the ſurface of the earth, and from the whole race of vegetables and animals which ſubſiſt upon it. Theſe putrid exhalations conſtitute the true genuine vegetable *pabulum*, or food, of plants; therefore, whatever ſubſtance of an abſorbent nature attracts thoſe principles more powerfully than the ſoil it is laid on, will, to ſuch land, be a manure, and infallibly improve the ſame.

Thoſe ſubſtances which are of a calcareous nature, and can be burnt into lime, have their powers as manures greatly improved thereby; provided they are uſed ſo as to impregnate the ſoil before their virtue is diminiſhed or impaired by being expoſed to the air. Lime, of whatever ſubſtance it is made, whether of ſtone, chalk, or ſhells, by being expoſed to air for a few days, expands and falls into a fine powder, and thereby loſes its active principles cauſed by the fire, and becomes totally effete and dead, poſſeſſed preciſely of the ſame virtues as the ſtone, chalk, or ſhells, of which it was burnt, and no more.

Of the successful Introduction of many new Articles into Field Culture.

Turnips, potatoes, cabbage of different kinds, carrots, parſnips, &c. were cultivated for domeſtick uſes, long before the time propoſed; but the field culture of theſe articles for the feed of cattle in any conſiderable degree is quite a modern practice.

Many kinds of graſſes have likewiſe been ſtrongly recommended as valuable improvements, which, having anſwered the ſiniſter views of ſome of the recommenders, in ſelling their ſeeds at a great price, have very deſervedly fallen into diſuſe, and are no more thought of. But there are two articles, however, commonly reckoned among the graſſes, which muſt ever be diſtinguiſhed and ſeparated from thoſe that have been found uſeleſs, that is to ſay, Sainfoin and Lucerne; theſe merit more attention and care than have been uſually beſtowed upon them, and would well repay the farmer for all his expence and trouble.

Sainfoin has been ſown pretty extenſively in ſome parts, but not ſo generally by far as it deſerves. It generally ſucceeds well upon chalk, from whence it has been very erroneouſly concluded, that it will not thrive in a deep ſoil.

The writer is clearly of opinion, that there are few arable farms in the kingdom which are not capable of great improvement by planting of ſainfoin, more eſpecially thoſe which are but poorly provided with good paſture and meadow land. The pooreſt fields of ſuch farms might by proper management be brought to produce good crops of ſainfoin; and land, the natural intrinſick value of which is not more than from 2s. 6d. to 5s. an acre per ann. might certainly, at at a very moderate expence, be made worth from 25s. to 40s.

The greateſt enemies ſainfoin has to encounter are graſs and weeds: theſe, in land that is tolerably good, ſoon overcome and deſtroy it, unleſs the farmer will take the trouble, and be at the expence, of keeping it clean.

Lucerne, under a ſimilar management, would be a very great improvement on arable farms. Indeed an opinion generally prevails, that it requires a much better ſoil than is commonly found. Crops of all kinds are more abundant on a good than on a bad ſoil, if they are kept clean; but it it is a very erroneous opinion, that lucerne will thrive only on rich land. It may be raiſed to great advantage on land of a very indifferent quality, by the ſame means as ſainfoin, and the ſame care to keep it free from graſs and weeds.

Of articles which are truly uſeful and entirely new, we know of few that have been introduced within the time mentioned. The turnip-rooted cabbage is a truly valuable root, which was accidentally diſcovered about twenty years ago, and has been cultivated with great ſucceſs by ſeveral gentlemen, and ſtrongly recommended by them to the attention of the farmer. Both its roots and greens are exceeding good food for cattle, but what conſtitutes its principal excellence is its extreme hardineſs, for it reſiſts the violence of the moſt rigorous ſeaſons and ſevereſt froſts. When the common turnip and hardeſt cabbage have been entirely cut off and deſtroyed, this has continued its fine verdure, and ſupplied the kitchen with greens, and the cattle with ſweet and wholeſome roots, even till the middle of May.

Another new article which has been very lately introduced is the *Mangel Wurzel*, or Scarcity Plant. From the ſucceſs ſome few gentlemen have had in its cultivation, it ſeems to promiſe to be of the greateſt utility for the feed of cattle.

Another article of food for cattle has been lately recommended as the ſweeteſt and beſt in the world, ſold under the title of *Carolina Graſs Seed.* I ſowed a very ſmall quantity of the ſeed in my garden in April laſt; it came up well, and is now in a very flouriſhing ſtate. Time will diſcover if it is in any degree ſuperior to many of the ſpontaneous productions of our own climate.

With reſpect to the New Articles above ſpecified of Field Culture, applied to the Rearing and Fattening of Cattle.

The improvements made by cultivating turnips for the feed of ſheep and fattening of cattle are ſo generally known and evtenſively practiſed, that it ſeems unneceſſary to ſay any thing on that head.

Of all the articles we have mentioned, or that are yet known, perhaps very few can equal, and none excel the *Potatoe.* The ineſtimable value of this root is hardly to be conceived. It is not only an almoſt conſtant diſh in great and opulent families, but in times of ſcarcity and dearneſs, the poor are almoſt wholly ſubſiſted by it. It is of late date that they have been extenſively cultivated for the feed of cattle; and even now, I am pretty clearly of opinion, that if they were much more generally cultivated than they have hitherto been, the farmer would find his account in it, eſpecially where a ſubſtitute is much wanted in the winter and ſpring ſeaſons for the ſupport of his cattle.

Hogs are immoderately fond of potatoes, and will live entirely upon them till they are fit to put up a fattening for pork or bacon; and then, boiled and mixed with barley or peaſe meal, they fat them ſpeedily and make fine meat. Another uſe I have put them to, which has been little practiſed, or thought of; that is, for the feed of milch-cows. Three gallons a day, half at night and half in the morning, are quite ſufficient to keep a large cow in full milk, and the milk as ſweet and as good as in the ſummer months. Nothing excels them for the feed of cows which are fattening their calves for the butcher.

I have had no experience of their uſe as food for horſes; but I have been aſſured by a gentleman who reſided ſome years in Ireland, that he kept his hunter, a ſtone-horſe, entirely upon them inſtead of corn. He ate nothing elſe, excepting hay between his feeds of potatoes, as other horſes; yet he was as fat, as healthy, as ſtrong, and as full of ſpirits, as if he had given him all the corn he could eat.

Extract from a General View of Agriculture in the County of Dorset.

[By JOHN CLARIDGE, *of Craig's-Court.*]

THE number of ſheep kept in the county, from the beſt enquiry and computation I have been able to make, amounts to upwards of 800,000; and the number ſold annually and ſent out of the county, amounts to upwards of one hundred and fifty thouſand.

In one particular inſtance the ſheep-owners excel all other parts of the kingdom; which is in providing ewes to yean at a remarkable early ſeaſon, in the Midland counties, which ſupply the metropolis with fat lambs.

To deſcribe the true Dorſet ſheep may be difficult, as to its ſize and ſhape, but I apprehend, that if the face and noſe are white, and the claws or feet without any mixture of colour, the forehead woolly, and the face long and broad, the horn round and bold, and projecting rather forward, a broad ſhoulder, ſtraight back, broad loin, deep carcaſe, and ſhort in the leg, it is the neareſt to the true deſcription of a Dorſet ſheep. This attention to have the ſheep without colour is conſidered of material conſequence by the breeders of early lambs, as they are ſaid to be of more value for the London market, on account of the extreme delicacy of the meat.

The ſeaſon for putting the moſt forward ewes to the ram, is the laſt week in April, for ſuch as are to be ſold the following autumn. And for the flock (which are to be kept) about Midſummer. The lambing-ſeaſon, therefore, for the forward ewes, is about the middle of September, and they are ſold about a fortnight before this time at the fairs near London. The lambs produced from theſe ewes are ſuckled in the houſe, on many farms round the metropolis, which makes the houſe-lamb fit for the table as early as Chriſtmas. The other part of the flock leſs forward do not yean till the beginning of December, but thoſe yield a conſiderable profit, by their lambs being fattened upon graſs, very early in the ſpring, near London, and produce what is called the earlieſt graſs-lamb. The lambs kept in the hands of the breeders are always taken from the ewes in May, and are then worth 11s. or 12s. each. They are always ſhorn in this county about Midſummer, and produce from one pound to one pound and a half of wool each, and the ewes are alſo ſhorn about the ſame time. Lambs when ſhorn, if for ſale at the fairs in July, are worth about thirteen or fourteen ſhillings per head; at one year old the animal is called a hog, and produces four or five pounds of wool, and the carcaſe is worth about a guinea. The ſecond year the ſheep is a four-tooth; the fleece produces about four pounds and a half of wool, and the carcaſe is worth about twenty-five or twenty-ſix ſhillings. The third year the ſheep is a full-mouthed wether, and produces about five pounds of wool, and is then worth 30 ſhillings or a guinea and a half, is ſeldom kept longer, but generally ſold from the county.

The wool produced in this county is ſhort and fine, of a cloſe texture, and the quality of it is highly eſteemed in the manufacture of that ſtaple commodity called broad-cloth. It is ſold here by weys or weights of thirty-one pounds ſtanding, and the average price is ten-pence or ten-pence halfpenny per pound; lambs wool produces about an halfpenny, or a penny per pound leſs.

The wether ſheep are conſtantly folded all the year round, running over the ewe leas or downs by day, and are penned on the tillage by night; they are penned late in the evening, and let out from the fold before ſunriſe in the winter, and not later than ſix o'clock in the ſummer. The ewes are folded only in ſummer, that is, when they have no lambs.

The ſheep are conſtantly attended by a ſhepherd the whole day, whoſe wages are ſix ſhillings per week, a great-coat yearly, and a breakfaſt on a Sunday. A dog is found and maintained by the ſhepherd; and the maſter has the ſkins of the dead ſheep.

A GENERAL AVERAGE OF THE PRODUCE OF WOOL:

Wethers.		*Ewes.*	
Firſt year, a hog,	1½lbs.	Firſt year, a chilver	1¼lb.
2d ditto, four-tooth,	4½lbs.	2d ditto,	3½lbs.
3d ditto,	2 lbs.	3d ditto, ſix-tooth	5 lbs.

Upon the whole, from a due obſervation of the quality and number of ſheep bred and kept in the county, it may be ſuppoſed, with ſome degree of accuracy, that the produce of wool, annually, is ninety thouſand weys, or weights, of thirty-one pounds each.

The number of wethers ſold	50,000
The number of ewes	100,000
The number reared	450,000
And the home conſumption	200,000

The breed of horſes in this county is not particularly attended to: a ſlight blood horſe is made uſe of for the field and road, and a very ordinary ſtyle of cart-horſe uſed in agriculture. Some cart-colts are bred in the vale of Blackmoor; and many others are brought in, either as ſuckers or wearlings, from other counties. The average price for a cart-horſe, at five years old, is 16 or 17 guineas.*

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* Wherever horſes are uſed in agriculture, which (with every predilection for oxen) muſt be the caſe in ſome diſtricts, it is of great importance to adapt their ſhape and ſize to the buſineſs required. It is an object worthy of much conſideration. Some particular ſize and properties of the horſe muſt claim a decided preference. It cannot be right to encourage all or various growths,

Oxen are often uſed in agriculture here; and the breed are of two kinds: thoſe on the weſtern ſide of the county are chiefly from the red ox of Devonſhire, an excellent ſort;† and the others in the more eaſtern and northern parts, are a mixture of the Hampſhire and Wiltſhire, with many croſſes of the Oxfordſhire, Gloceſterſhire, Shropſhire, and North-country beaſts. As the cattle are very much

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for ſimilar purpoſes in ſimilar ſituations: and there is ſo great a difference between the expence of a horſe far too big and heavy, and one of a ſufficient ſize to anſwer the end, (whether we conſider the *keeping*, the *movement*, or the *caſualty* which attaches to large and and coſtly horſes) that the prejudice for *ſhew* ſeems to require much correction. It is a known fact reſpecting this animal, that ſtrength of bone and ſinew is not in proportion to largeneſs of ſize; but they are found to be denſe and ſtrong as the horſe approaches in fineneſs, even to the racer. And thoſe farmers who have made cloſe remarks on this ſubject, and have given a fair trial to the lower compact horſes, not fifteen hands high, but of good ſymmetry, have found and muſt find their account in uſing them. Perhaps a ſtronger proof cannot well be urged in favour of a diminiſhed ſize, than the well-known capability for great labour, even of the ſmall horſes of the New-Foreſt, when trained to waggon uſes.—This is a fact which, if duly reaſoned from, would remove much prejudice, and do much ſervice to the country. One ſtrong inducement to many capital farmers to breed and train colts of the largeſt ſize, is the demand for dray-horſes in the capital, and the large prices they bring: but theſe inducements cannot operate generally; and perhaps, in moſt inſtances where they do operate, they influence too far for individual or general advantage. Editor.

† The foregoing remarks on the horſe will, in ſome degree, apply to the Devonſhire ox, as a creature for labour in agriculture.—They have confeſſedly the advantage over larger oxen, for expedition and continued labour, cheapneſs of keeping, and quickneſs of fatting.—And if there be little reaſon for objection againſt the Devonſhire cow, on account of her giving leſs milk in proportion than others, (which objection is not allowed by ſome good judges) this race of females alſo requires more preference than ſeems to have been given it. Editor.

uſed in dairies in this county, very little attention is paid to the ſize of the beaſt, or the ſhape or colour; but if likely to make a good milker, it ſeems all that is neceſſary, and is worth from eight to ten guineas, to come into the dairy at a proper age.

The oxen chiefly fed in the county are of the Devonſhire breed, and go when fat to Smithfield market, and are ſaid to be the fineſt-grained meat in the kingdom. Theſe are moſtly fed in the vale of Blackmoor, which extends from north to ſouth about nineteen miles, from Gillingham and Silton to Danton and May-Powder; and from eaſt to weſt, from Compton and Sutton, about fourteen miles, to North-Wotton and Long-Burton; and contains upwards of one hundred and ſeventy thouſand acres of very rich land, chiefly grazing, dairying, and about one-tenth part in arable, with ſome plantations of orchards.

The other cattle grazed here are either home-breds, or heifers brought from Ringwood and other Hampſhire fairs, and when fat, ſupply the home market, and ſometimes are ſent to Saliſbury.

The breed of pigs in this county is not ſo good in ſhape, as either in the Hampſhire, Berkſhire, or Hertfordſhire ſort; they are of a light colour, and feed to about nine or ten ſcore on an average for bacon.

The dairies extend all over the county, cow-calves in general are reared, and bull-calves afford a ſupply of veal. The management of the dairy, as every where practiſed in Dorſetſhire, is unknown to many other parts of the kingdom. The cows are all let out by the farmer to a dairy-man, at a fixed price for each cow, according to the quality of the land and produce of the beaſt: in ſome of the pooreſt parts of the county as low as fifty ſhillings, or three pounds per head per annum; and in others, as high as ſix pounds ten ſhillings, or ſeven pounds; and in one pariſh near Beaminſter, called Broad-Windſor, as high as eight pounds: but I believe the general average throughout the county will be about ſix pounds for a cow of full growth; four pounds for heifers, and four pounds ten ſhillings, or five pounds, for three-years old. The uſual plan for letting a dairy is this: the farmer finds the dairy-man a certain number of cows for one year, commencing at Candlemas, at a fixed ſum agreed on: he feeds, fodders, and ſupports, the ſpecific number throughout the year; he finds a houſe for the dairyman and his family to live in, and allows him to keep as many pigs and poultry as he thinks proper, and the keep of a mare to carry out his butter, &c. which, by producing a foal yearly, is conſidered a material advantage to the dairyman. The dairies in general are managed by making all the cream into butter, and from the ſkimmed milk, an inferior ſort of cheeſe, which ſells from twenty-five to thirty ſhillings per hundred weight in the county; and the butter, which is worth from eight-pence to ten-pence per pound, is in general ſalted down in tubs, and ſupplies Portſmouth and the London markets; but there is alſo made a conſiderable quantity of a better ſort of cheeſe, which brings a price as high as thirty-ſeven ſhillings, or two guineas per hundred weight. Some farmers, particularly in the neighbourhood of Dorcheſter, and indeed in many other places, are very choice in their cows.

Of the commons in Dorſetſhire, the greater part of them, in the incloſed country, are ſtinted. The greateſt proportion and extent of waſte-lands in the county, is in its ſouth-eaſtern part from below Bere-Regis; ſouthward, towards Lulworth and the ſea, extending all the way to Corfe-Caſtle, Wareham, and Poole, from thence towards Chriſt-church in Hampſhire, and within a ſmall diſtance of Wimborn-Minſter, the greater part of which (except a few cultivated pariſhes which interſected it) is in its preſent ſtate a moſt dreary waſte; and almoſt the only advantage derived from it at this time is the ſupport in ſummer of a few ordinary cattle and ſheep, and the heath, which is pared up by the ſurrounding villagers for fuel.

"I conſider," ſays Mr. Claridge, "the great outlines for improvement in Dorſetſhire to conſiſt in the introduction of the Norfolk huſbandry, which is certainly the moſt productive of any arable diſtrict in the kingdom—the ſeparation of tenures—the cultivation of waſte land, and the ornamenting of it by plantations."

Extract from a general View of the Agriculture of the County of Wilts.

[By Mr. Davis, of Longleat, Wilts, Steward to the Moſt Hon. the Marquis of Bath.]

MR. DAVIS divides the county into South-eaſt and North-weſt diſtricts. That uſually denominated South Wiltſhire, more properly South-eaſt Wiltſhire, comprehending the part of the county called Wiltſhire Downs, is divided into two principal ſubdiviſions, called Saliſbury-Plain, and Marlborough-Downs, and contains in all about ſeven hundred and eighty ſquare miles, or five hundred thouſand acres. The diſtant appearance of the whole is that of a large elevated plain, but the ſurface is broken into numberleſs inequalities, and interſected by ſeveral deep vallies, formed by brooks or rivulets chiefly riſing within the diſtrict, and on which the villages, with very few exceptions, are ſituated.

The ſoil of this diſtrict, though various, is in a certain degree uniform. The hills are chalk, with its uſual accompaniment of flint. The land on the ſide of the hills, from which the flints have been waſhed, is chiefly a chalky loam, or, rather, a diſſolved chalk, (provincially called white land); the flatter parts are generally a flinty loam; and the center of the vallies, next the rivulets, is uſually a bed of broken flints, covered with the black earth waſhed from the hills above; and in ſome of theſe, there are veins of peat, formed by the black earth, without any mixture of flints.

But there are ſome very ſingular ſand-veins running through a large portion of this diſtrict; and there are ſome inſtances of ſtrong clays and clayey loams on its ſkirts; but they make no part of the corn and ſheep diviſion of the county; and the quantity of this land is ſmall. Theſe ſoils, with all their conſequent mixtures and variations, may be ſaid to conſtitute the far greater part of this diſtrict.

The climate of Wiltſhire Downs is ſo well known for its coldneſs and keenneſs, as to be almoſt proverbial.

The preſent Diſtribution of the Lands in this Diſtrict may, in general, be divided into Two Kinds:

1ſt. The farms in *ſeveralty* (or thoſe not ſubject to rights of common.) Theſe are in general from 100l. to 300l. per annum: ſome inſtances lower than 100l. but few ſo high as 400l.

2d. The tenantry yard-lands, (or cuſtomary tenements) which are ſtill ſubject to rights of common. Theſe are in general from 18l. to 25l. per annum; ſome as high as 40l. per annum; great numbers of which are ſtill occupied *ſingly*, although conſolidations of them are every day taking place.

The ancient Distribution was in the following way:

In general, there was in each manor *one* great farm called the Lord's Farm, which had its lands in ſeveralty, and diſtinct from the tenants.

The reſt of the manor, called the Tenantry Part, was divided into ſmall copyhold tenements or farms, called "Yard-Lands;" each of which was originally *nearly* of *equal value*, and enjoyed *equal rights* of commonage.

Theſe tenants ſent their ſheep to one common flock, where they were kept by a common ſhepherd; and their cows and plough-oxen to a common herd, where they were kept by a common herdſman.

As the neceſſity of a common ſheep-flock ſtill continues for the ſake of manuring the common-field lands, a conſiderable part of theſe ſmall properties, called Yard-Lands, are ſtill occupied in their original ſtate of commonage; although the tenure of them is in many inſtances changed from copyhold, ſome to leaſes for lives, ſome fallen into the lord's hands and let at rack-rents, and ſome ſold off in fee, and frequently many of them occupied by one perſon. The value of theſe yard-lands is different in different parts of this diſtrict, as is already ſtated, and of courſe the quantity of land in each varies very conſiderably. There are many inſtances where a yard-land of about 20l. per annum contains about two acres of meadow land, eighteen acres of arable, (frequently in eighteen or twenty pieces) and a right on the common fields, common meadows, and other commonable places, for perhaps forty ſheep, and as many cattle as they can winter with the fodder growing on the premiſes.

Much of the ſingularity of the occupation of the lands in this diſtrict ariſes from its natural ſituation. The ſhape of the manors being generally a narrow oblong, and frequently with the houſes and buildings at one end, there are many inſtances where manors are near three miles long, and little more than half a mile wide.

The application of the land is almoſt uniform. The common meadows, *of which the greateſt part are watered*, immediately adjoin the river: the houſes and ſmall incloſures as near to it as poſſible. Next follows the arable land, until the land becomes too ſteep or too thin to plough, and then the ſheep and cow downs, and frequently the woods at the extremity of the manor, and adjoining the downs or woods of the manors in the oppoſite bourn.

General Custom of feeding the Commonable Lands.

The common ſheep-down is open for the common flock during ſummer and autumn. The unſown field (or ſummer field) is open till it is all ploughed for wheat. The ſheep have then only the down, till the harveſt is over, and the other fields are clear. They then have thoſe fields and the down until the winter obliges the owners to give them hay. Until this period they are folded on the arable fields in a common fold: but when they begin to eat hay, every commoner finds his own fold and his own hay; the common ſhepherd feeding and penning the whole. When the ewes are near yeaning, the owners take them home to their incloſed meadows; and by the time all the ewes have yeaned, the water meadows are ready to take them to graſs. In ſome inſtances, the water meadows are common for the ſheep ſtock; in others, they are private property.

When feeding the water meadows, the ſheep are penned on the barley land; and by the time the water-mead graſs is eaten, and the barley ſown, the ſummer field (eſpecially if ſown with ray-graſs) is ready to receive the ſheep, where they generally ſtay till near ſhear-time, and then go to the down until the ſtubble fields are broken, at which time (perhaps about the middle of September) they uſually put the rams to the ewes. Theſe rams are provided, and the common ſhepherd paid, at the joint expence of the commoners. As in this ſtate of commonage (where there muſt neceſſarily be a great ſcarcity of winter food) it is neceſſary to reduce this ſheep ſtock before winter, it is cuſtomary to ſell off the old ewes and the wether lambs about Michaelmas, and put out the ewe lambs to winter, either on paſture land or turnips, in other parts of the county, and frequently in the adjacent counties.

Cow commons (called cow-downs) are frequent in the undivided parts of this diſtrict, but not general. They were more general formerly than now, many of them having been, at different times, turned into ſheep commons by conſent of the commoners. Theſe cow-downs are uſually the beſt and moſt level parts of the down lands, and are ſometimes worth from 5s. to near 10s. per acre.

The common herd of cows uſually begin to feed the cow-downs early in May, (uſually Holy-Rood Day) and finiſh when the fields are clear of corn.

Water Meadows.

There is, perhaps, no part of this kingdom, where the ſyſtem of watering meadows is ſo well underſtood, and carried to ſo great perfection, as in this diſtrict. This, which is ſo juſtly called by *Mr. Kent* "the greateſt and moſt valuable of all improvements," was *generally* introduced into this diſtrict in the latter end of the laſt, and the beginning of this, century. Many of the moſt valuable and beſt-formed meadows, particularly in the *Wyly Bourn*, were made under the directions of one farmer Baverſtock, of Stockton, between the year 1700 and the year 1705. And at preſent there is ſcarcely a river or brook in the diſtrict, that is not applied in ſome way or other to this purpoſe.

It has been alleged by thoſe who know very little of water meadows, that they render the country unwholeſome, by making the water ſtagnant. Daily obſervation proves the fact to be otherwiſe in Wiltſhire; and the reaſon is obvious. It may be ſaid, that a water meadow is a "*hot-bed for graſs*;" the action of the water on the land excites a *fermentation*; that fermentation would certainly in time end in a *putrefaction*: but the moment putrefaction begins, vegetation ends. Every farmer knows the commencement of this putrefaction, by the ſcum the water leaves on the land; and if the water is not then inſtantly taken off, the graſs will rot, and his meadow be ſpoiled for the ſeaſon. The very principle of water meadows will not permit water to be ſtagnant in a water-mead country; it muſt be always kept in action to be of any ſervice: beſides, many of the beſt water meadows were, in their original ſtate, a ſtagnant unwholeſome moraſs.

As ſoon as the lambs are able to travel with the ewes, (perhaps about the middle of March) they begin to feed the water meadows. Care is, or ought to be, taken to make the meadows as dry as poſſible for ſome days before the ſheep are let in.

The graſs is hurdled out *daily* in portions, according to what the number of ſheep can eat in a day, to prevent their trampling the reſt; at the ſame time, leaving a few open ſpaces in the hurdles for the lambs to get through, and feed forward in the freſh graſs. One acre of *good graſs* will be ſufficient for five hundred couples for a day. On account of the quickneſs of this graſs, it is not uſual to allow the ewes and lambs to go into it with empty bellies, nor before the dew is off in the morning. The hours of feeding are uſually from ten or eleven o'clock in the morning to about four or five in the evening, when the ſheep are driven to fold; the fold being generally at that time of the year (as has been mentioned before) on the barley fallow. And the great object is to have water-mead graſs ſufficient for the ewes and lambs, till the barley ſowing is ended.

As ſoon as this firſt crop of graſs is eaten off by the ewes and lambs, the water is immediately thrown over the meadows, (at this time of the year two or three days over "each pitch" is generally ſufficient) and it is then made perfectly dry, and laid up for a hay crop. Six weeks are uſually ſufficient for the growth of the crop. It ſeldom requires eight; and there have been inſtances of great crops being produced in five. The hay of water meadows being frequently large and coarſe in its nature, it is neceſſary to cut it young; and if made well, it then becomes of a peculiarly nouriſhing milky quality, either for ewes *or* dairy cows.

Water meadows are reckoned to be perfectly ſafe for ſheep in the ſpring, even upon land that would rot ſheep if it were not watered, but in the autumn the beſt water meadows are ſuppoſed to be dangerous. This is at preſent an inexplicability in the operations of nature, and a diſcovery of the reaſon might perhaps lead, in ſome meaſure, to a diſcovery of the cauſes of the rot in ſheep. But the circumſtance itſelf is rather an advantage, than a diſadvantage, to this diſtrict, as it obliges the farmers to keep a *few dairy cows* to feed the water meadows in autumn, and to provide artificial graſſes, or other green crops, for their ſheep during that period.

From what has been ſo repeatedly urged, on the neceſſity of making water meadows *dry*, as well as wet, every reader muſt have inferred the advantage of having them, if poſſible, on "*a warm abſorbent bottom.*"*

A looſe gravel, or what, perhaps, is ſtill better, a bed of broken flints, with little or no intermixture of earth, where-ever it can be obtained, is the moſt deſirable bottom.

Comparison between Drill-Husbandry and Broad-cast.

It is not for me to decide on a ſubject, on which both the beſt writers and the beſt farmers in the kingdom, have ſo long been divided in opinion; viz. "Whether the drill-"huſbandry is or is not ſuperior to the broad-caſt?" They have both, undoubtedly, their merits; or neither of them would have been ſo long, and ſo ably defended. Different ſoils and ſituations require different management. Why may not ſome be particularly adapted to one kind of huſbandry, and ſome to the other? What are the Wiltſhire drag ploughs, but imperfect drill ploughs? And if the drag ploughs have been found, by thirty years experience on Wiltſhire downs, to have inſured good ſtout clean crops of wheat, ſurely the application of a drill-box to the *very ſame inſtrument*, ſo as to depoſit all the corn at *one* depth, muſt be an improvement. So much for the down land. As for the ſand land, the greateſt enemies of drill-ploughs allow their uſe in land in which the ſeeds of all weeds being ſure to vegetate, repeated hoeings are neceſſary to prevent their choaking the corn. If there be any who doubt it, the *ſand* veins of Wiltſhire will convince them; but they muſt come ſoon. In ſeven years time, or leſs, if the land can be put into ſeveralty, they will, in all probability, ſcarcely find a *broad-caſt ſand-farmer* in the county.

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* There is a ſtriking proof of the truth of this remark in the water meadows near Hungerford, and particularly at Standen. Although they are laid out in no regular plan, and in many inſtances there are no drains to empty the water carriages, yet the gravel bottom is ſo very abſorbent, that the water will ſoak out in a few hours, and the meadows be left as dry as if they were watered on the moſt ſyſtematic plan. And few meads in the county produce better crops either of ſpring feed or of hay.

Perhaps *ſtrong clays* may furniſh objections to drilling, and particularly to *drilling wheat.* Undoubtedly, the reaſons given for drilling upon Wiltſhire hills do not apply to land of this deſcription; nor does ſuch land require *hoeing*, like the ſandy ſoils. But it ought to be conſidered, that *nature* ſupplies the uſe of the drill-plough in ſtrong clays, eſpecially under their favourite crop—'wheat.' The clods, at the time of ſowing, are a gage to determine the proper depth of every wheat corn; and the pulverization of thoſe clods by the winter froſts and the March winds is the hoeing of *nature*, inſtead of that of *art*; and as in ſuch ſoils the weeds are too few, and grow too ſlow, to do any miſchief, no other hoeing is in general wanted.

"What *is right one year, and even for years together, may* "*another year be wrong*;" and that farmer who happens to ſuffer ſeverely by purſuing a *right ſyſtem* in a *wrong year*, is ſhy of it for ever-after; eſpecially if he has ſuffered by *deviating from any old mode*, to which a popular opinion has been long attached.

In many of the light lands, where ploughing is very little required, unleſs to deſtroy the weeds, Mr. Cooke's inſtrument, called a *ſcuffler*, which will clean five or ſix acres of land per day, has been uſed with great ſucceſs, and particularly preparatory to drilling. But this inſtrument is not yet enough known, to be in general uſe.

Cattle used in Ploughing.

Oxen are not in general uſe in this diſtrict; and in ſome parts of it, perhaps, not ſo much as formerly, when there were more common cow-downs.

It is not that the arguments, which have been ſo often and ſo ſucceſsfully uſed on the *comparative advantages* of uſing oxen inſtead of horſes, are not known, or not underſtood, in Wiltſhire; there are local reaſons peculiar to many parts of this diſtrict, which will prevent oxen from coming into general uſe. The firſt and principal is, the preſent *ſcarcity of incloſed paſture land*, and the inaptitude of a large portion of the ſoil of the diſtrict to make more. The next is, the peculiar *difficulty* of uſing them on the *public roads*, on account of the diſtance of many farms from a market, the ſteepneſs of the hills, and the flintineſs of the roads. Some of the moſt intelligent farmers perſevere in the uſe of oxen, and find them (eſpecially ſince they have exchanged the yoke for the collar) to anſwer a very good purpoſe. As a ſhifting ſtock, where a farmer wants more ſtrength at one time of the year than another, oxen are peculiarly proper, being more eaſily bought and ſold, and that at a leſs loſs or riſk than horſes. And where a farmer has a quantity of rough down land, I am clearly of opinion, that the treading of a few oxen will increaſe the ſheep-feed more than their eating will diminiſh it. I have ſeen ſo many inſtances of downs decreaſing in goodneſs, when changed from cow-downs to ſheep-downs, as to convince me fully of this fact.

Common-Field Huſbandry.

The peculiar diſadvantages attending the common-field ſtate of huſbandry in this diſtrict are the obligation of ploughing and cropping *all kinds of ſoil* alike; the almoſt total precluſion that a common flock makes to any *improvement of ſheep ſtock*; the difficulty, and in ſome inſtances, the impoſſibility of raiſing ſufficient *hay* or *green winter-food* for the ſtock; and particularly the very great expence and trouble, and the additional number of *horſes* neceſſary, in occupying lands in detached and diſperſed ſituations.

The advantages to be neceſſarily derived from incloſures ſpeak for themſelves: but in many parts of this diſtrict, theſe advantages apply much more forcibly to the caſe of the great farmer, than of the ſmall one.

The farmer of one hundred and fifty, or two hundred pounds a year, will perhaps be able, in conſequence of having his land put in large pieces, to reduce his number of horſes *one-third*; he will be able to ſow clover, ſaintfoin, &c. for hay, and raiſe turnips and rape for winter food for his ſheep; of courſe he will not only be enabled to increaſe his flock, but to winter them at home; and though, by this mode of huſbandry, he muſt reduce his number of *acres* of corn, yet he will, by his additional number of ſheep, be able to dung his land ſo much better, that he will raiſe *more grain* than he did before.

Not ſo with the occupier of twenty pounds a year upon Wiltſhire downs. He will certainly have the conveniency of having his land brought together in *fewer pieces*. But as it ſeldom happens, that he could plough his land with fewer than three horſes before ſuch a diviſion, neither can he now do with leſs. He has no incloſed paſture to put theſe horſes in, nor common to turn them on. His right on *the downs* being too ſmall to make it worth his while to take an allotment for a ſheep-down, (of perhaps *twenty acres*, two miles from home) he takes an increaſe to his arable land in the fields near home in lieu of it. But now he can keep *no ſheep* on this allotment, nor would it be worth his while to employ a *ſhepherd* for *ſo few*, if he could. *Without ſheep* he cannot dung his land, becauſe having little paſture land, and no cow-commons, he can keep *no cows* to make *dung* with his ſtraw; and the arable land being in general ſo little adapted to turn to graſs, he is prevented from incloſing his allotment, and laying it down to paſture.

It may be anſwered, that the peculiar locality of great part of this diſtrict is ſuch, that it was not calculated for the ſeparate occupation of farms of twenty pounds a year.

I allow this argument in its full force; and if it were now required to colonize a pariſh in South-Wilts, it would not be prudent to make the diviſion of farms ſo low as twenty, or even forty pounds per annum. But men of this deſcription are *already here*; they are ſettled on the ſpot; it is in many inſtances their own. Juſtice will not let them be diſpoſſeſſed *without their conſent*. Policy and humanity forbid they ſhould be injured, *even with their conſent*.

Great part of the *ſand land* in this diſtrict is peculiarly applicable to all the purpoſes of a *ſmall farmer*, or as it perhaps may be better termed, a *garden farmer*.

As quickſet hedges will grow well upon it, it may eaſily be incloſed, and it will, if required, turn readily to *paſture*, ſo that cows may be kept on one part to make dung for the reſt.

If *ſheep-folding* be neceſſary, crops of clover for hay, and of turnips for winter food, may be raiſed, on which *ſheep* from the down farmers may always be taken in *to winter*; and with proper manure, ſuch land will bear *perpetual* crops of almoſt any kind of corn that may be required. And ſuch land is peculiarly applicable to the culture of *potatoes*, *peaſe*, and ſuch other crops as are the particular *province* of a *ſmall farmer*.

Paring and Burning

Land is not in general uſe in this diſtrict of Wiltſhire, in preparing old arable land for a crop; but is frequently, indeed almoſt univerſally, uſed in breaking up new down lands.

Paring and burning land, or, as it is called in Wiltſhire, "burn-beaking," though by ſome ſuppoſed to be a new mode of huſbandry, is perhaps, *coeval* with, if not *more ancient*, than ploughing. When land was to be reclaimed from a ſtate of wood land, as great part of this iſland undoubtedly originally was, *manual labour* was alone applicable to the purpoſe. —The wood was cut off, the principal parts of the roots grubbed, and then the rough graſs and moſs, and the whole ſurface of the land, were chopped up with a curved cutting mattock, and burnt to aſhes, and thus the land was prepared for ſowing. This mattock was called a *beak*; and the operation was therefore, and is ſtill frequently, called "*beaking and burning*." Perhaps no method could be better ſuited to the original purpoſe of cleaning rough, incumbered land, in which it was almoſt impoſſible for oxen or horſes to work a plough, than this operation of beaking. And the action of the fire not only conſumed the roots and weeds, and other incumbrances, but corrected the acidity of the ſoil, and rendered it fit for the production of corn. The operation not only anſwering the purpoſe of cleaning the land *better* and *cheaper* than it could have been done by the plough, but ſerving as *manure* for ſeveral ſucceſſive crops.

But, unfortunately, this cuſtom, like many others originally good, has, in ſome inſtances, remained, after its original cauſes have ceaſed to exiſt, and in others is applied under circumſtances for which it was never intended. Paring and burning may be called a powerful medicine, which is only proper when properly applied, but which in improper caſes may do, and ſometimes has done, miſchief almoſt irremediable.

No down land ſhould be broken up, but *ſuch as will bear corn for a continuance*, after the ſtimulus excited by the firſt burn-beaking is ſubſided. No down land will bear corn *for a continuance*, unleſs it be manured with ſome *permanent alterative manure*, and there is no ſuch manure to be had on Wiltſhire downs but *chalk*.

The *red land will in general bear chalking. The black land ſeldom or never will.*

The red land therefore, provided its texture be *ſtrong*, *cohesive*, and *ſour*, and particularly if it be deep in its ſtaple, and incumbered with ſtrong buſhes or furze, may in general be broken up; and provided ſuch land is intended to be properly chalked afterwards, no great harm can be done by burn-beaking it previous to the firſt crop, provided the ſurface be pared thin, and as little of the earth burnt as poſſible. Perhaps it is not only the cheapeſt, but the beſt, way of bringing it into tillage.

The black land ſhould by no means be broken. It is always too light, and generally too thin, for a ſtate of tillage. Chalk has apparently no effect upon it, and if it has, it is to make it lighter. This kind of down land is in general the ſweeteſt paſture, and even the appearance of heath upon it does not indicate that it would not be ſo, if it were properly ſtocked and cloſe fed.

This ſyſtem of burn-beaking ſeems to have a tendency to ſubvert the long-eſtabliſhed huſbandry of Wiltſhire—*the ſheep-fold*, and to introduce a ſyſtem, which, however proper it may be in ſome parts of the kingdom, is not at all applicable to this diſtrict, and appears to carry with it the ſeeds of its own deſtruction.

The general fault of the ſoil of a great part of Wiltſhire down land is, that it is already "too light and too thin." The ſheep-fold is particularly adapted to remedy this fault, by adding to the coheſion of the land. If *this ſyſtem be right on ſuch land, a continuance of burn-beaking muſt be wrong.*

In ſpeaking of water-meadows, it has been often objected, that they are local; and that there are many parts of the kingdom in which they neither *can be made*, nor are they *neceſſary if they could be made.*

There are, undoubtedly, *many parts* of the kingdom in which water-meadows *cannot be made*; but nobody will deny, but that there are *thouſands of ſituations* where they could be made, in which they *have never been tried.* And as for their uſe, it may be ſtrongly ſuſpected, that thoſe who deny it have never been in Wiltſhire *in the month of April.* Let thoſe who call it in queſtion point out a ſubſtitute on which a farmer can, with *equal certainty*, depend for the ſuſtenance of his flock in that *trying month.*

Notwithſtanding the great advantages that have been derived from the introduction of green winter crops, ſuch as turnips, rape, cabbages, &c (*advantages to this kingdom almoſt beyond eſtimate*) yet this may be laid down as a certain maxim, that, whether the winter be hard or mild—whether the ſpring be late or early—nature will always have, in this climate, *an "inter-regnum" between the end of one year's food and the beginning of another.* The ſame temperature of the air in the ſpring, which brings on the graſs, will occaſion all the green winter crops to run to ſeed, and not only to loſe their own nouriſhing quality, but to exhauſt the land on which they grow.

A moment's reflection will convince every man, that nature muſt unavoidably and conſtantly leave this *chaſm* in the year's food. *Winter*, though driven into a ſmall compaſs, *is ſtill winter, and art alone can expunge it from the calendar.*—*Hot-houſes and hot-beds* have, in a great meaſure, done this for the *gardener. Water-meadows*, which are "*hot-beds for graſs*," will as effectually do it for the *farmer.*

Improvements Suggested.

The errors in ſtock may be reduced to one general cauſe, viz. "the pride or vanity of poſſeſſing large, handſome animals.

As to ſheep in particular, this pride of ſtock, however commendable, and however profitable it may be in countries that are adapted to it, does not ſeem at all ſuited to the *bleak hills of Wiltſhire.*

" Warmth and ſhelter are as neceſſary to produce perfect " ſymmetry in the parts of an animal, as to unfold the " wings of a butterfly, or expand the petals of a carnation." Where theſe requiſites to animal perfection cannot be had, it is uſeleſs to attempt breeding for beauty.

But it may be aſked, whether thoſe requiſites cannot be had, and warm ſheltered ſituations be found, in Wiltſhire? Undoubtedly they may; but *not in a ſheep-fold on Wiltſhire hills*; and particularly at that time of the year when the fold is almoſt invaluable—" The fold of ewes and lambs for a barley crop." It can never be too often repeated, that ſo long as South-Wiltſhire remains a corn country, the *ſheep-fold* muſt be the *ſheet-anchor* of its huſbandry; and until a new method can be found to manure its hill land, equally efficacious with the ſheep-fold, breeding ſheep, as a ſcience, *ſolely for the beauty of the ſhape*, can never be introduced with ſucceſs into this diſtrict.

The pride or vanity of ſtock has been almoſt as hurtful to the farmers of this diſtrict, in the article of horſes, as in ſheep. In both inſtances, the attention has been much more directed to get *large* rather than uſeful animals. Large heavy-heeled black horſes have long been the faſhion, and have almoſt driven the ſmart, active, and *really uſeful*, horſes out of the diſtrict.

It has been often aſſerted, that the benefits the Wiltſhire farmers derive from their excellent markets, are more than paid for, by the expence of keeping fine horſes to carry their corn to them. There are many inſtances, where the expence of keeping up a fine team of horſes amounts to nearly the rent of the farm on which they are kept; and this expence is very ſeldom counterbalanced by any profit ariſing by buying them in when colts, and ſelling them at five or ſix years old, to go in ſtage-waggons or London drays, although this has been the great pretence for keeping this kind of horſes.

The *cow ſtock* of this diſtrict is not numerous enough to be a ſubject of much animadverſion, with reſpect to *its kind.* The great error in this ſtock is the ſmallneſs of the *quantity* kept, the rage *for fine ſheep* having almoſt driven the cow ſtock out of the diſtrict. South-Wiltſhire farms are not calculated to keep *many cows*, but the greater part of them would keep more than they do, eſpecially ſuch as have much down land; and that, if repeated experience may be relied on, without diminiſhing the ſheep ſtock.

Where there are water-meadows, cows are indiſpenſably neceſſary to eat the after-graſs; and in winter they are always ſo, to eat the barley ſtraw, and make dung. There is always as much diſtant land on a South-Wiltſhire farm as the ſheep-fold can manure. The home arable ſhould be manured with pot-dung, and more eſpecially when in preparation for a turnip crop.

In ſumming up the errors in the ſtock of this diſtrict, it is worthy of remark, that the attempts to improve the breed of ſheep, horſes, and cows, have uniformly been, *by enlarging the ſize of the animal*; whereas, the only animal, in which a *real change for the beſt* has been made in this diſtrict, "*the pig*," has been improved by *reducing its ſize*, and introducing a kind that will *live harder*, and that will be *fit for uſe at an earlier age.*

The term of years to be granted by a leaſe ſhould be ſo calculated as to bring *all* the land, or *as much* of it as poſſible, round in ſucceſſion a *certain number of times*; ſo that the tenant may have juſt as many *complete years produce*, as he pays *years rent*, and *leave* the farm exactly *in the ſtate he en-*

tered upon it. A term of twelve years ſeems, therefore, to be moſt appropriate to the general huſbandry of South-Wilts.

Much has been ſaid and written about the proper ſize of farms. *The impolicy of large farms* has been very frequently and very ably diſputed, and perhaps the *poſſibility of their being too ſmall*, in particular counties, might have been as clearly demonſtrated, were it not that it is an unpopular argument, and that there are few, who would not rather have their judgment, than their humanity, called in queſtion. But after all that has been, or can be, ſaid on the ſubject, the ſize of farms muſt always depend on ſoils and ſituations, and modes of huſbandry; and every country *has its level*, to which farms of a certain ſize are peculiarly adapted; and if they are much above or below this, they muſt be managed to the diſadvantage of the occupiers.

Thoſe farms are of the moſt proper ſize, which return the moſt proportional produce at the leaſt proportional expence. This ought to be the great object of every land-owner. The object of every tenant is to live by his induſtry; if that induſtry will not allow him to live, he had better be a labourer.

In thoſe modes of huſbandry where the hands, as well as the eyes, of the farmer, and of every branch of his family, can be fully employed, ſmall farms can be managed to advantage. In dairy farms this is peculiarly the caſe; and it is frequently ſo in countries where the land is partly applied to breeding cattle, and partly to raiſing corn, eſpecially where lime, ſea ſand, and ſimilar manures, are to be fetched from a diſtance on horſes' backs, as in Devon and Cornwall; and where the ploughing is entirely, or chiefly, done by the oxen bred on the farm; and even in ſome parts of South-Wiltſhire, where ſmall farms are ſituate on ſandy ſoils, they may be applied, on a garden ſyſtem, to raiſing eſculent vegetables very advantageouſly.

In theſe caſes, where circumſtances enable *ſmall farmers* to do almoſt the whole of the neceſſary work of their farms *with their own families*, they can bring their produce to market on equal terms with the large ones. But on Wiltſhire-down farms, where horſes are neceſſary to plough the land, and ſheep to manure it, the little farmer ſtands on a very diſadvantageous compariſon with the great one, being obliged to be at much greater proportional expence in horſes and ſervants.

Every Wiltſhire-down farm, if even ſo ſmall as 40l. per annum, provided it is to be manured by the ſheep-fold, requires a ſhepherd, a carter, and a plough-boy, and ſeldom leſs than three horſes, but frequently four; and yet a farm of double the ſize may be managed frequently with one, or at the utmoſt with two additional horſes, and with one, or at any rate with two additional boys. For, whether theſe ſervants and horſes have or have not full employ, their expence will be nearly the ſame; and if the farmer takes one branch of the active labour upon himſelf, the other branches are ſuffering for want of his ſuperintending eye.

The ſize of a Wiltſhire farm ſhould be, therefore, ſuch as the maſter's eye, and one *principal* ſervant in each department, can manage properly; and for this, one head carter, with ſuch a number of boys as may occaſionally be wanted, and one head ſhepherd, with aſſiſtance at ſeaſons of urgency, will generally be ſufficient. Perhaps the loweſt ſize of a Wiltſhire-down farm, that can be managed to advantage, is a good *ſix* horſe buſineſs and the higheſt a *nine* horſe buſineſs, or *ten* at the utmoſt. Beyond this extent, *two* men are required in each of theſe ſubordinate capacities; a jealouſy is excited between them; the maſter's eye is inſufficient to manage them, and a bailiff is neceſſary.

2. North-West District.

Soil.

The ſoil of the North-Weſt diſtrict, though not ſo uniform as South-Wilts, may, nevertheleſs, be reduced to a few leading features; and thoſe, in general, may be better defined by a deſcription of the ſub-ſtrata, or under-ſoils, than by any peculiar characteriſtics of the upper-ſtratum, or top-mould.

The under-ſoil of a large proportion of it (viz. in a direction from Cirenceſter to *Bradford*) is a looſe, irregular maſs of that kind of flat broken ſtones, called in Wiltſhire "corn grate," of which the greateſt part of the Cotſwold-Hills in Glouceſterſhire is compoſed, and which runs without interruption, through the North-weſt part of Wiltſhire, to its termination at Frome in Somerſetſhire; the ſtones being, in ſome places, thin enough for ſlates to cover houſes; in others, laying in large flat beds, fit for pavement, and in ſome aſſuming the ſhape and qualities of freeſtone; but, in general, lying in thoſe looſe, flat, broken pieces, ſo well adapted to building the dry fence walls in common uſe on Gloceſterſhire hills, and in many parts of this diſtrict, and lying uſually in horizontal beds, mixed with earth.

The top-ſoil of this rock, or rather maſs of ſtones, is chiefly that kind of reddiſh, calcareous loam, mixed with irregular, flat, broken ſtones, uſually called "ſtone braſh."

The goodneſs of this ſoil varies very much, according to its comparative depth to the rock, and according to the abſence or preſence of an intervening vein of cold, blue clay. This clay is of a marley appearance, but in general not ſufficiently calcareous to be valuable as manure, and its preſence is obvious to every traveller, by its natural and ſpontaneous production of oak trees; while its total abſence, or, at leaſt, its lying very deep, is as ſtrongly denoted by the ſpontaneous and plentiful production of beautiful elms.

The North-weſt verge of the county, viz. from near Cirenceſter, by Malmſbury, and on the weſt ſide of the road from London to Bath, may be truly called the Cotſwold part of Wiltſhire. This part is, on account of the thinneſs and looſeneſs of its ſoil, *uſually*, and in many inſtances, *neceſſarily*, kept in an arable ſtate; while the adjoining land, viz. about Chippenham, and from thence ſouthward, thro' Melkſham and Trowbridge, which happens to have a greater depth of ſoil, and has a pure warm rock, without the intervening vein of cold clay, is capable of grazing the largeſt oxen, and is, perhaps, one of the moſt fertile parts of the county, unleſs, poſſibly, the vein of gravel next deſcribed, may be excepted.

There is a vein of gravel, of a moſt excellent ſmall, pebbly, ſhelly kind, and in general covered with a good depth of rich loam, which runs in a broken line from Melkſham through Chippenham to Cricklade; but its greateſt body extends from Tytherton through Chriſtian-Malford and Dantzey to Somerford, and perhaps the richeſt part of it is at or near Dantzey. It is a moſt excellent under-ſoil, warming and drying the top-mould, and it is only to be lamented, that its quantity in this diſtrict is ſo ſmall. It is uſed for roads and walks, and, when waſhed or ſcreened, for drains in the cold clay lands which border upon it.

There are two principal veins of ſand in this diſtrict. They are in general red, and of a ſharp, looſe, gravelly texture, and of courſe not ſo fertile as the tough, cloſe ſands of South-Wiltſhire.—Some detached maſſes which have a mixture of ſome other ſoils, are generally more fertile than the principal veins. Under the ſand land at Swindon lies a ſingular rock of ſtone of a moſt excellent quality, ſerving equally, in its different beds, for the purpoſe of building houſes, paving, and covering them.

The climate, although milder than that of the high lands in the South-eaſt diſtrict, is nevertheleſs cold, and in general unfavourable to the purpoſes of early ſpring vegetation, owing probably to the cold retentive nature *of the under-ſoil of great part of this diſtrict.*

Mode of Occupation.

This diſtrict is for the moſt part incloſed, though not entirely ſo, there being ſtill a few common-fields remaining, and ſome commons, but no very extenſive tracts of either.

The ſtone-braſh land, on the North-weſt verge, is chiefly arable. A great part of the reſidue is in graſs land, and a great proportion of that part is applied to the dairy, particularly to the making of cheeſe. But although ſo great a portion is now in a ſtate of incloſed paſture land, it does not appear to have been ſo from any remote period of antiquity.

The cheeſe of this diſtrict was for years ſold in the London markets by the name of Gloceſter cheeſe, but is now well known by the name of "North-Wiltſhire cheeſe."

It was at firſt doubtleſs an imitation, and perhaps an humble one, of that made in the vale of Gloceſter; but is now, in the opinion of many, at leaſt equal, if not ſuperior, to that of the favourite diſtrict of Gloceſterſhire, the hundred of Berkeley.—Mr. Marſhal, who has ſo fully examined, and ſo ably deſcribed, the preſent ſtate of the dairy in both diſtricts, leans ſtrongly to that opinion.

The dairy-farms in North-Wiltſhire have, in ſome caſes, a ſmall quantity of arable land annexed to them, in others not.

Live Stock.

It does not appear, at this time, what was the original kind of cow kept in this diſtrict; probably, the old Gloceſterſhire cow—a ſort now almoſt extinct, or, perhaps, as is now the caſe in Somerſetſhire, a mixture of all kinds. But the univerſal rage, for upwards of twenty years paſt, has been for the long-horned, or, as they are called, the "North-country" cows; and at this time, perhaps, nine-tenths of the dairies in this diſtrict are entirely of that kind.

Two oſtenſible reaſons are given by the dairy farmers, for continuing this kind of ſtock, viz. that they can make more cheeſe from each cow; and that the cows will yield more when thrown off to be fatted, than any other ſort.

The quantity of cheeſe produced from each cow in this diſtrict is certainly, as Mr. Marſhall juſtly obſerves, amazingly greater than is common in any other cheeſe-making diſtrict; ſometimes as high as 4½ cwt. or near 5 cwt. per cow; ſeldom lower than 3 cwt.; perhaps 3½ cwt. is a good average in a good cheeſe-making year, on every cow that calves in proper time. But the ſecond reaſon, viz. that this kind of cows produce more than any other kind, when ſold for fatting, is an anſwer to the firſt, for this ſimple cauſe, becauſe they are bigger.

If, therefore, it can be proved, as the oppoſers of this breed ſay it eaſily can, that four cows of a ſmall ſize will, with the ſame food, produce as much or more cheeſe than three of the large long-horned kind, it will be eaſy to prove, that the ſmaller kind will be the moſt eligible ſtock; firſt, becauſe, in caſe of the death of an animal, the loſs is not ſo ſerious, and, principally, becauſe the weight of a large animal is an eſſential injury to land of which the great fault is, its being already too cold and wet. Beſides, it is allowed, even by the advocates for this kind of cow, that they do not come to perfection, until they are, at leaſt, two years older than cows of a ſmaller kind; and that, whatever may be the comparative merits of the females, the oxen are certainly not only the uglieſt, but the worſt and leaſt ſaleable, of all kinds bred in this kingdom.

Pigs are looked upon to be a neceſſary appendage to every dairy farm: a great number are bred with the whey and offal of the dairy, and many fatted; barley-meal, mixed with the whey, is the general fattening food; peaſe are not ſo much uſed as formerly.—The kind of pig is generally a mixture of the long-eared white, with the black African, or negro pig; which croſs has been found to be a very great improvement.

There are great numbers, both of cattle and ſheep, fatted in this diſtrict. The cattle conſiſt chiefly of long-horned cows, turned off from the dairies, and of oxen brought from different counties, particularly from Devonſhire. They are uſually bought in very early in the ſpring, ſo as, if poſſible, to be finiſhed with graſs; but the largeſt and lateſt are taken into the ſtalls, and finiſhed with dry meat, chiefly hay.

Many ſheep are bred in this diſtrict; part on a folding ſyſtem, and part purpoſely for fatting. The number of ſheep folded has certainly decreaſed, and perhaps a ſtill greater decreaſe will and ought to take place on land which can be better appropriated than under that ſyſtem.

The decreaſe of the number of ſheep bred in many parts of the kingdom, and the vaſt increaſe in the conſumption of mutton, ſeems a paradox to be accounted for in no other way, than by ſuppoſing the animal to be killed at an earlier age, and this certainly is the fact. Sheep were *formerly* not thought *eatable* till four, five, or even ſix years old; at this time, three-fourths of the mutton is killed at two years old.

Waste Lands.

Although the greateſt part of this diſtrict appears to be incloſed, and it contains no very extenſive entire tracts of waſte land, yet there are numerous ſmall commons in almoſt every part of it, in a very neglected, unimproved ſtate: and there are many pariſhes, in which there are ſtill common-fields; and thoſe in a very bad ſtate of huſbandry.

With reſpect to the decreaſe of population, already felt in conſequence of former incloſures, or to be apprehended from future ones, it is to be obſerved, that the extinction of lifehold tenures, which has been gradually taking place for the laſt century, tends, undoubtedly, to decreaſe the number of farmers; and that though this event may be ſometimes haſtened by incloſures, yet that it may, and frequently does, take place without them. But in this part of the county, where land is in general ſo valuable, the effect of conſolidating ſmall farms will not be ſo viſible as in South-Wiltſhire.

In many parts of this diſtrict that are ſtill in a common-field ſtate, the landholders would be much greater gainers by an incloſure, than it is poſſible they can in many parts of the South-eaſt diſtrict of the county; as there are ſo many parts of the land that, when incloſed, may be applied to the purpoſes of a ſmall farm, without the neceſſity of keeping a flock of ſheep to manure it; viz. by keeping that part which will be neceſſary to remain in arable, on a turnip ſyſtem, either for feeding cattle or ſheep, or for wintering ſheep for the down farmers; by laying down the wet parts of graſs, either for the dairy or for feeding; and by applying the ſand lands, on a garden ſyſtem, to raiſing eſculent vegetables. While on the thinner and poorer parts of the North-weſt part of the county, which muſt neceſſarily continue in an arable ſtate, the improvement to be obtained from incloſures muſt be derived from putting the occupation into *fewer hands*, and making farms of ſuch a ſize as can be managed to the greateſt advantage of the tenant, the landlord, and the community.

With reſpect to the decreaſe of *labourers* in this part of the county, there is very little to be apprehended from incloſures. So little manual labour is done to the unincloſed land, in its preſent ſtate, that every alteration that has improvement for its object, muſt increaſe manual labour, and of courſe, the number of labourers.

The fencing and draining the land, and making and keeping good roads, in a country naturally ſo deep and wet, will be a perpetual ſource of employ for labourers.

Theſe are the improvements, which have already ſo wonderfully increaſed the value of land in this diſtrict; and as ſo much remains to be done, there will probably be, in future, more complaint for want of labourers, than for want of work to employ them in, eſpecially in the neighbourhood of the manufacturing towns.

Draining.

The uſe of covered drains has been long known in many parts of this diſtrict. They have been made in different modes with turf, with wood, with ſtone, but chiefly with the latter, on account of the facility of getting it, there being but few parts without ſtone of ſome kind or other, within a moderate diſtance.

Beneficial Practices.

The ſyſtem of making cheeſe, as managed in North-Wiltſhire, would certainly be of the greateſt ſervice in many parts of the kingdom, if it could be introduced into them; and the production of good cheeſe, in this diſtrict, from land otally diſſimilar, as ſtated in the preceding obſervations, ſhews that the goodneſs of this article does not depend ſo much on ſoils or ſituations as is generally imagined. Indeed it is well known, that the fame of this diſtrict for good cheeſe is not very ancient. The circumſtance of its being ſold for Gloceſter cheeſe till within theſe few years, ſhews that Gloceſterſhire had the *name* firſt; though the quantity now made in that county is far leſs than what is made in this diſtrict, according to the report of Mr. Marſhall, who ſpent much time in both diſtricts, for the purpoſe of examining into this particular branch of rural œconomy.

Good butter is made in every part of the kingdom, becauſe the proceſs is ſimple, and known every where; and if the ſame methods were practiſed in making cheeſe in other counties, as are uſed in this, there ſeems no good reaſon why cheeſe of equal goodneſs might not be made in many other counties.

Price of Proviſions.

The prices of proviſions in Wiltſhire, and particularly in the South-eaſt part of the county, when compared with the other Weſtern counties, may be ſaid to be high.

It is a melancholy fact, that without any particular habits of oppreſſion on the part of the farmers, or diſſoluteneſs on the part of the poor, the labourers of many parts of this county, and particularly of South-Wiltſhire, may be truly ſaid to be at this time in a wretched ſituation.

The farmers complain, and with reaſon, that the labourers do leſs work than formerly; when, in fact, the labourers are not able to work as they did at a time when they lived better.

Manufactures.

The extent of commerce, or rather of manufactures, in the county of Wilts, is very great indeed; but the woollen manufactory is, by far, the moſt general. Indeed, there is ſcarcely a town in the county, that has not a manufacture of ſome kind or other.

Extract from a General View of the Agriculture of the county of Glocester.

[By Mr. George Turner, of Dowdeſwell.]

THE ſoil about the Cotſwold Hills is various; the greater part, what is here termed "ſtone braſh," a loam intermixed with ſtones, on a ſub-ſoil of calcareous rubble or rock; the average depth of ploughing not much exceeding four inches: there is however ſome quantity of ſtiff ſour land interſperſed on theſe hills, many farms and one or two whole pariſhes are chiefly of that nature. Near Fairford and Cirenceſter the ſoil is richer and deeper; particularly about the former a deep and ſandy loam prevails, producing great crops in a favourable time, but apt to burn and parch up in dry ſeaſons; at which times they likewiſe labour under great inconveniences for want of water, with which the greater part of theſe hills are abundantly ſupplied.

The Properties are moſtly large, and the occupations likewiſe; there are however ſome exceptions in both; but it is the opinion of experienced men, that farms of from 200 to 500 acres can be managed with much greater advantage to the farmer and the publick than ſmaller ones.

In the vallies, and where the land is of a ſufficient ſtaple for permanent meadow and paſture, it is moſtly in that ſtate. Sheep and cow downs are likewiſe frequently met with; but the quantity of land thus employed, bears but a ſmall proportion to what is occaſionally under the plough; ſome few pariſhes on the ſides of the hills, however, are an exception to this rule, in which perhaps half the land is meadow and paſture, worth from 20s. to 30s. per acre. In theſe ſituations dairying is moſtly followed, in preference to grazing; the ſort of cows chiefly Glouceſterſhire, frequently croſſed and improved from other breeds. Moſt farmers dairy a little for home conſumption; and though the nature of the ſoil renders ſheep the live ſtock chiefly to be attended to, yet a ſufficient quantity of cattle generally is, and always ought to be, intermixed with them to improve the paſtures, and make the moſt of the keep.

The native *ſheep* of theſe hills, in their unimproved ſtate, was a ſmall light-carcaſſed, polled animal, bearing, in the memory of an experienced agriculturiſt now living, a fleece of fine wool of about 3lb. weight, but lighter and finer before that period. They were cotted in former times, but that practice has not been in uſe ſince the remembrance of the perſon alluded to, from which circumſtances it is very probable that the aſſertions of ancient authors, that the Spaniards procured their breed of fine-woolled ſheep from the Cotſwold-Hills, are founded in fact, though contradicted by ſome modern writers.

Probably no part of the kingdom has been more improved within the laſt forty years, than the Cotſwold-Hills. The firſt incloſures are about that ſtanding; but the greater part are of a later date. In the open-field ſtate, a crop and fallow was the uſual courſe. What is here called the "ſeven-field huſbandry" now generally obtains; that is, about a ſeventh part ſainfoin, and the remainder under the following routine: turnips, barley, ſeeds 2 years, wheat, oats.

Sainfoin is much cultivated; the uſual management has been to ſow it with barley after turnips, three buſhels per acre, to which is generally added about five pounds of trefoil, which generally improves the firſt year's produce, and by occupying the ſoil, prevents the weeds from getting a-head till the ſainfoin has eſtabliſhed its roots.

The farmers in general do not wiſh it to laſt longer than ſeven years; the land being in that time thoroughly reſted and fit for corn, whilſt other land under the plough wants reſt; but if deſired, it might, with proper management, laſt ten or twelve years. The hay, if well made, is, in the fore part of the ſeaſon, equal to any meadow hay in the diſtrict for moſt purpoſes. When worn out, ſo as not to be worth mowing, it is generally paſtured a year or two, which thickens the turf, and of courſe produces more and better aſhes, when pared and burnt, in which method it is always broken up.

Turnips, in the uſual practice, ſucceed oats; the ſtubble is ploughed in autumn or the beginning of winter, in which ſtate it lies till ſpring ſeed-time is finiſhed; when, being well dragged, it receives two or more ploughings, if neceſſary, with ſufficient dragging and harrowing between, and allowing as much time as poſſible between each operation for the ſeeds of weeds to vegetate and be deſtroyed. The dung of the farm-yard is chiefly applied to this crop.

Barley—is ſown after turnips, on one ploughing, as ſoon as the peaſe and oats are got into the ground. Graſs ſeeds are either ſown before the laſt time of the harrows, or after the barley is come up, and before rolling it; in which caſe it is uſually covered in with a buſh hurdle: quantity of ſeed three buſhels; average produce 24 buſhels per acre.

Graſs ſeeds—chiefly ſown, are from two to ſix pecks ray-graſs, and from five to ten pounds trefoil; likewiſe a ſmall quantity of broad and white Dutch clover; but the light land is apt to tire of the broad clover, if often ſown in quantity; and the white Dutch is getting out of repute for ſheep feed. In the common practice the ſeeds are mown for hay the firſt year, and grazed the following ſummer, when the land is ploughed up for wheat.

A very valuable ſort of *ray graſs* has been cultivated, for twenty years paſt, by Mr. Peacey, of North-Leach. He has alſo cultivated the *orchis graſs*, a broad-leaved graſs, that ſprings directly after the ſcythe in mowing grounds; he finds this very uſeful on barren land, that will bear no other graſs.

The method of ſowing wheat in this diſtrict under notice is rather ſingular. The land is ploughed from two to ſix weeks before ſowing, as circumſtances permit; if it gets quite graſſy, it is thought better. The firſt rain that falls in Auguſt in ſufficient quantity to thoroughly ſoak the land, begins the ſeed-time; from thence to the middle of September is thought the beſt time. The ſeed is dragged in with heavy drags, working the land till the furrows are well broke, but rather wiſhing to leave it rough than otherwiſe; if frequent ſhowers fall during the dragging in, ſo as juſt to allow the drags to work, it is thought better by moſt people. Experienced men ſay that our land, being naturally too light for wheat, is by theſe means rendered more ſuitable to it; at the ſame time that weeds are very much checked, which is a very material object where the corn is ſo long on the ground.

The wheat ſtubble is mowed, if worth it, or otherwiſe harrowed, when it becomes brittle enough to break off, and carted to the fold-yard; and the land ploughed, as ſoon as leiſure and the weather will permit, for Oats, which are harrowed in as ſoon as the land will work, in February, about four buſhels per acre, average produce 24 buſhels.

Winter Vetches are, in the practice of a few individuals, ſown in quantity to eat off with ſtore ſheep; they are uſually ſown after wheat, as ſoon after harveſt as opportunity allows.

The ſheep are put on them the latter end of May or beginning of June. They are commonly hurdled off in the ſame manner as turnips; but if a bulky crop, the better way is to give them through rack hurdles, which are made the ſame as the common five-railed ones, only leaving the middle rail out, and nailing ſpars acroſs at proper diſtances, to admit the ſheep to put their heads through.

Manures are chiefly thoſe of the fold-yard. The wheat ſtubbles are frequently mown or raked for litter, and cattle kept in ſufficient quantity to eat the ſtraw, but this is not always the caſe; large heaps of ſtraw are ſeen in ſome parts of the diſtrict, rotting at the barn-doors for want of cattle to eat and tread it into dung, and this generally for want of a ſufficiency of paſture to ſupport the ſtock in ſummer.

Aſhes from burnt turf, or graſſy ſtubbles, are very beneficial, and ſuch land is uſually broken up in that way.—Lime is too expenſive for manure; nor, from two or three experiments that have come under my obſervation, does it ſeem worth attention, if that were not the caſe. Soot has been tried on ſainfoin to great advantage, but it is not to be procured in ſufficient quantity for any conſiderable practice. Marl has been formerly uſed in different parts of the diſtrict; a pit has been opened of late years in the neighbourhood of Northleach, to the great improvement of ſome adjoining graſs grounds. Folding ſheep is little practiſed or approved of.

Watering meadows has long been practiſed; there is, probably, no conſiderable quantity of land capable of that improvement, without interfering with the mills, where it is not done.

The waggon of this diſtrict is deſcribed by Mr. Marſhall, and by him allowed to be the beſt in the kingdom for huſbandry uſes. The carts are very good for hauling out dung, but not ſo well calculated for road work and other uſes.

Horſes and Oxen are both uſed—the latter in harneſs, and getting ground, but not ſo much as they ought.

Farm-Houſes and Offices, in the old incloſures, are frequently unhandy and inadequate to the farms annexed to them, which doubtleſs ariſes from the improvements in huſbandry. In new incloſures, they are, in general, conveniently ſituated, with ſufficient ſhed-room for cattle and implements.

The fences are uſually dry ſtone walls, good quarries of which are generally very handy. Quick hedges are ſometimes planted, but the attention and time required to raiſe them is a great objection. In one or two inſtances they have been planted within ſide the walls with great ſucceſs—it is a pity the practice is not more general.

Population is ſuppoſed to have increaſed on theſe hills of late years, and it is generally believed that incloſures, by finding more employment, tend very much to promote, at leaſt, uſeful population.

The Value of Draining has been long underſtood and practiſed in this diſtrict, old drains of wood and ſtone being frequently met with in making new ones. A great deal has been done of late years; there is ſtill much to do; but ſome of the ſtiff ſour land which moſt wants it, is of ſo retentive a nature, that the drains will not draw to any conſiderable diſtance.

Paring and Burning is very much practiſed and approved; old ſainfoin lays, and all turf of a ſufficient texture, are uſually broke up in that way. Turnips are often the firſt crop; and from the freſhneſs of the land, and the good effects of the aſhes, a large crop is generally obtained.

Coppices are much wanted. Aſh thrives remarkably well on this ſoil, and is uſeful for hurdles and gates, as well as for fuel, which is a very ſcarce article; the coppices we have are chiefly compoſed of this wood, which is fetched from a great diſtance for cooper's and other uſes.

In the new incloſures, a part of the property has been given in lieu of tithes. One-fifth of the arable, and one-ninth of the paſture, and in ſome inſtances, two-ninths of one, and 1-8th of the other, have been aſked and agreed to.

The ſoil on *the Stroudwater Hills* is chiefly light loam; not ſo tenacious as the Cotſwolds, nor ſo productive; there is likewiſe ſome quantity of ſour wet land; the climate is nearly ſimilar to the Cotſwolds; the properties are various, as is the ſize of the farms. On the hills, ſtrictly ſpeaking, it is ſuppoſed, nine-tenths of the land are arable. The approved courſe of crops, the ſame as before noted of the Cotſwolds. In the vallies there are large tracts of good meadow land, which is applied both to grazing and the dairy; but moſtly the latter. There is ſome quantity of land watered, and a great deal more is capable of that improvement; but the mills interfere greatly. For the dairies the cattle are chiefly bred, and are in general good; in grazing, the ſtock is more generally bought in, and are of various breeds, according to their application, the opinion of the grazier, and the goodneſs of the land.

Sheep, on the hills, are the chief ſtock; theſe are moſtly of the horned Wiltſhire breed, the fleeces average nine to the tod of twenty-eight pounds.

The Rotation of Crops, it has been obſerved, is ſimilar to that on the Cotſwolds. I ſaw here an application of turnips quite new to me. Mr. Hayward gives them in quantity to his farm-horſes, which he finds keeps them very healthy, and induces them to eat the barn chaff and other dry meat with a better appetite;—they were, when I ſaw them, in very good condition, though I was informed they had had no corn for half a year paſt, and were conſtantly worked.

There appears to be a great deficiency of ſhed-room in this diſtrict. Implements of huſbandry of all ſorts are either left in the grounds where laſt uſed, or at beſt have only the ſhelter of a tree to preſerve them; nor are the yards much better accommodated for wintering cattle. In regard to live ſtock, it is ſtill worſe; cattle fed on ſtraw, in expoſed and unſheltered ſituations, are ſure to ſink conſiderably; and are liable, when ſpring comes on, to the yellows and other complaints, which greatly injure, and ſometimes prove fatal to them. Dairy cows in the open fields, down in the vale, are known to ſink very much in bad winters, though foddered with good hay. On the contrary, where good yards are conſtructed, with plenty of ſhed-room, and attention is paid to littering them down occaſionally, and keeping the cattle dry and comfortable, they ſometimes even improve on the ſtraw, and are ſure to come out healthy and thriving in ſpring.

The land is chiefly in an incloſed ſtate; but in ſome inſtances, additional partitions are wanting; the fields being too large for the proportion of the farm for any particular crop, which is attended with great inconveniences; ſome open fields remain, but are faſt diſappearing.

The Woollen Manufactory is carried on to great extent in this diſtrict.

Queries ſent by the Society at Bath to the High-Sheriffs of the different Counties in England.

IN June 1778, the Society formed the following liſt of Queries relative to Agriculture; and directed them to be tranſmitted to the High-Sheriff of every county, requeſting him to procure anſwers thereto from ſome of the beſt farmers, and ſend to the Society.

QUERIES.

1ſt. What are the kinds of ſoil from which you generally obtain the beſt crops of wheat, barley, peaſe, oats, beans, vetches, turnips, carrots, and cabbages? And what are the uſual quantities of ſeed ſown, and the average annual produce per acre, Wincheſter meaſure?

2dly. What is the uſual courſe of crops adopted by your beſt farmers on the different ſoils?

3dly. What manure now generally in uſe do you find moſt ſerviceable on the following ſoils reſpectively, viz. Stiff clays, light ſand, gravelly, moory, cold and wet, or what is called ſtone-braſh land; in what quantities are the ſeveral manures laid on per acre,—at what ſeaſon,—and how long will each laſt without renewal?

4thly. Have you diſcovered any *new* manure more efficacious than thoſe generally uſed, and which may be eaſily obtained in large quantities? If ſo, what is it, when and how applied?

5thly. What is the beſt top-dreſſing for cold wet paſtures, which cannot be eaſily drained?

6thly. What materials do you find beſt and moſt laſting for drains, or land ditches?

7thly. What are the kinds of wood which you have found from experience to thrive beſt on bleak barren ſoils, cold ſwampy bogs, and black moory ground?

8thly. What are your methods of raiſing lucerne, ſainfoin, and burnet?—On what lands do you find them to anſwer beſt, and what the average produce?

9thly. How is your turnip huſbandry conducted; and what is the beſt method of preventing or ſtopping the ravages of the fly on the young plants?

10thly. Do you prefer the drill to the broadcaſt method of ſowing grain;—in what inſtances, and on what ſoils?

11thly. What is the comparative advantage of uſing oxen inſtead of horſes in huſbandry?

12thly. What have you found to be the moſt effectual preventative or remedy for the rot in ſheep?

13*thly.* What new improvements have you made or adopted in implements of huſbandry?

To the above Queries the Sheriff of the county of Suffolk favoured the Society with the following anſwers; which he informed them were given him by a very good farmer, and approved by all who had ſeen them.

To the firſt and ſecond.—Good ſtrong mixed ſoil. Wheat on clover-lay, after one year, once ploughed, and ſown broadcaſt, with ten pecks per acre, well harrowed in;—average produce, from 3½ quarters to 4 quarters per acre.

To prepare for Turnips the year following, ſummer-till the land; turn in the wheat-ſtubble about December a moderate depth, and let it reſt till the March following; harrow it well; then turn it in ſomewhat deeper, below the firſt ploughing, the deeper the better; for turnips thrive beſt where there is a plenty of deep mould. In May repeat the harrowing, and turn it up with a fine riſt balk. After it has taken the benefit of the ſun, harrow it down, and gather out the ſpire-graſs, &c. which ſhould be burnt in heaps upon the land. If it be not clean, repeat this a ſecond time; then give it a clean earth, and harrow it down. Manure it with twelve loads of ſhort dung, or eighteen of long dung per acre. At Midſummer, plough the dung in a good depth with a cloſe furrow, and ſow the ſeed cloſe after the plough. Sow from one pint and a half to two pints and a half per acre, as the ſeaſon and the quality of the land may require. In a month the plants will be fit to hoe. When they nearly cover the land, hoe them a ſecond time, with a ſeven or nine-inch hoe, and leave the plants at leaſt fourteen inches aſunder. The price of hoeing here is generally 4s. 4d. per acre the firſt time, and 2s. 2d. the ſecond. Set them out at leaſt a foot diſtant from each other. A good crop will produce from thirty to forty cart-loads per acre, which for many years paſt have ſold for from 3l. to 4l. per acre.

2dly. To prepare for Barley to lay in with Clover, plough the ſaid lands in February, as they are preparing and clearing off the turnips. Two *ſtirring* and one *ſowing-earths* will be ſufficient. Three buſhels per acre, well harrowed in, will be a good ſeeding. Then throw in broadcaſt from nine to twelve pounds of clover-ſeed* per acre, ſtruck over with a light harrow. Roll it down, or otherwiſe, as the ſeaſon proves wet or dry. Average produce, from three to five quarters per acre. The following year clover, two crops in the ſeaſon; firſt mowing in June, the latter in September; the general produce from three to four tons per acre. In October ſow the clover-ſtubble with wheat, as above directed, without manuring, or it will be winter-proud if the land be rich.

3dly. To improve ſtiff clay lands, lay on coarſe waſh-ſand, cinder duſt, wood-aſhes, ſtreet-dirt, or ant-hills quartered, taken up and burnt. Theſe mixed together, and laid on from thirty to forty cart-loads per acre, will laſt twenty years. If in plough tilth, keep it up with good rotten dung. If the land be not kind for clover, ſummer-tilth for wheat. Small beans, vetches, and grey-peaſe, will make proviſion for wheat, if clean and well conditioned. Red Lammas wheat is beſt for cold lands. Vetches cut green are excellent fodder for horſes; if ſeeded, they yield from two to two quarters and a half per acre; grey peaſe, three quarters: Wheat does well after them.—The above land, if laid down for three or four years until it becomes a thick flag, and then covered on the flag with forty tons of clay, or twenty tons of marle, or twelve tons of ſoaper's aſhes, per acre, will produce good corn and clover for twenty year's.

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* We apprehend ſix or eight pounds of clover-ſeed would be fully ſufficient; and that the clover ſhould not be ſown earlier than a fortnight after the barley. If they are ſown together, the clover, in rich lands eſpecially, will be apt to get above and choak the barley crop. EDITOR.

For gravelly, cold, or wet land, under drain, if it lie with a proper fall;—by thus removing the cauſe, the effect will ceaſe. Smmer-tilth and make it clean; lay on from thirty to forty loads of ſand per acre, if a little loamy, the better: or about ſixteen load of the above-mentioned compoſt, or ten or twelve tons of ſoaper's aſhes, laid on in hard froſt, will anſwer well.

4*thly*. We have not diſcovered any new manure more efficacious than thoſe above-mentioned. The burning of clay in kilns has been talked of, but not yet practiſed.

5*thly*. In cold wet paſtures that cannot be under-drained, make open drains, ſloped off eaſy on each ſide; keep them open, and make them with proper falls: then lay on ſoot, lime, or lime rubbiſh, ſoaper's aſhes, ſtreet-dirt, &c. about fourteen loads per acre, and it will laſt 14 or 16 years.

6*thly*. Materials for under-draining are, alders and ſallows, or ling and black-thorn buſhes, cut and laid in green, covered with peaſe or wheat-ſtraw, and above it ſtrong clay. Drains thus made will laſt twenty years.

7*thly*. The kinds of wood we find to flouriſh beſt on boggy ſoils, are, alder, ſallow, willow, and poplar. Scotch fir does well in a barren ſoil, eſpecially if it has a gravelly bottom.

8*thly*. Theſe graſſes are not raiſed with us.

10*thly*. We moſtly prefer broadcaſt to drill huſbandry.

11*thly*. We know of no other advantage in the uſe of oxen, than that of keeping leſs ſtock; as horſes are more expeditious, and will pay for their keeping by extra labour.

12*thly*. The moſt effectual preventative for the rot in ſheep is to keep them on dry land; it being found, by general experience, that wet lands bring the rot upon them, eſpecially if the feed be bare. In order to cure them, many experiments have been tried, but to little purpoſe.

13*thly*. Few new improvements in implements of huſbandry, that are of much conſequence, have been made or adopted in this part of the country.

General Rules for the Improvement of Lands by Claying and Marling, as practiſed by me.

1. Lands that have been many years in plough-tilth, and are become foul, may be made clean by a ſummer-tilth. When this is done, lay on from ſixty to eighty tons of clay, or from twenty to thirty tons of marle, per acre. Work it well into the lands, and then ſow turnips as before [illegible]. Feed the turnips off, or at leaſt half: by the treading of the cattle and their manure, the clay will incorporate and work more kindly with the ſoil. The ſpring following ſow it with barley.——*Or*, to clay upon a clover-lay before the wheat is ſown, is a very good method; it will be fit for a ſummer-tilth the next year.

2. To improve waſte or heath-lands—clay or marle on the flag from thirty to forty loads of marle, or one hundred and twenty tons of clay, per acre. Plough it in with a good wheeling-plough, a moderate depth, in the beginning of February; the ſooner the better. If the ſoil be wet and ſandy, ſow it with white oats. If a black gravelly ſoil, ſow black oats in the middle of March, at leaſt four buſhels per acre. As ſoon as the crop is off, ſow ſix pecks of rye per acre on one ploughing: this will make good *ſheep-feed*, and expoſe the clay to the winter froſts. Give a ſummer-tilth for turnips; feed them off in March with *ſheep* and other beaſts. Such manuring is beſt for ſuch lands.

If a kind of loamy ſoil, ſow barley; if a black gravel, oats. Experience teaches knowledge. Try a lay of clover with the following mixture, viz. clover-ſeed, and black and white nonſuch. If the lay takes, *ſet* red wheat upon it—ſuch lands ſometimes produce three quarters per acre. When they begin to wear out, improve them by the following method: lay them down with ſuch graſs-ſeeds as ſhall be thought proper, and let them reſt for three or four years till they become a flag.

Another method of improving ſuch lands is, to lay them up againſt winter in round ridges, four furrows on a ridge. Early in the ſpring, or ſooner if the ſeaſon will admit, turn it back, and make an early ſummer-tilth; then ſow it with buck-wheat, ſix pecks per acre, and let clover follow as above-directed. Forbear feeding it in the ſpring, as ſuch land will not bear treading.

It will anſwer to lay it down with any kind of graſs-ſeeds in the above method, and for a longer time. Let the land be well drained; for wherever the water ſtands, the clover will decay. Sow buck-wheat the latter end of May; it will produce three quarters per acre.

On ſtrong rich lands, clover lays with nonſuch, or any ſtrong flag, *ſet* wheat, as it will anſwer far better than ſowing it broadcaſt. Three pecks and a half per acre, ſet in two rows on each flag, are ſufficient. Strike it over with a light harrow buſhed. The ſaving of ſeed more than pays the planting, when wheat is only 5s. the buſhel; the price of planting from 8s. to 10s. per acre.* Small tick beans, 7s. per acre planting, hoeing 6s.; produce three quarters and a half to four quarters per acre. Windſor tick beans, 7s. planting; 6s. hoeing; produce four to five quarters per acre.

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* The expence is now reduced to 6s. per acre.

Answers to the Society's Queries, communicated by EDW. SAMPSON, *esq; Sheriff of Glouceſterſhire.*

To the firſt Query.—Cone wheat, and blue ball on ſtrong clays, and deep rich loams; the ſeveral kinds of Lammas wheat on loams, ſand, gravel, and ſtone-braſh land. Barley moſt natural on ſandy, gravelly, and ſtone-braſh; but it will return large crops on clay, although the grains are more coarſe and brown.

Peaſe for culinary uſes on ſands and loams;—for pigs, on clays, gravel, and ſtone-braſh.

Beans on ſtrong clay and deep loam, the ſame as cone wheat.

Vetches on gravelly ſoil and ſtone-braſh.

Turnips on every kind of ſoil, with good and repeated ploughings, and proper manures: moſt natural on a ſandy loam.——Cabbages on ſtrong deep clays and rich loams.

Carrots on deep loams abounding with ſand, and not too ſtiff; and on any deep light ſoil duly cultivated.

The quantities of ſeed depend much on the ſeaſon and time of ſowing. Wheat from ſeven to ten pecks per acre. Barley from ten to ſixteen pecks. Peaſe and beans ten pecks, if drilled; twelve, if planted; ſixteen, if ſowed, and earthed or harrowed in. Vetches from eight to ten. Turnips from ten to twenty-four ounces. Much depends on the ſkill of the ſower.

To the Second.—On clay and loamy ſoils, if old arable long in tilth, the following courſe is generally practiſed: 1. Turnips, as a fallow crop; 2. Barley; 3. Clover, mowed early, and then fed; 4. Wheat, on one earth; 5. Peaſe, or Beans; 6. Wheat, then Turnips.—If a new farm from paſture, 1. Beans, or Peaſe; 2. Wheat; 3. Barley: or, 1. Turnips; 2. Barley; 3. Clover; 4. Wheat, and then Turnips again.

On light thin and ſtony ſoils, 1. Turnips; 2. Barley; 3. Clover, mowed early and fed till Midſummer; then let it grow, and plough it in for wheat. Vetches in winter, and fed off for turnips

To the Third.—For ſtiff clays, ſand in due quantity; for light ſand, clay in due quantity: for both, lime duly prepared. Lyas lime for light ſands; marble lime for heavy ſoils.

For gravelly and loamy land—yard-dung, lime-chalk, and ſhovelling of highways, in compoſts.

For mooriſh and cold ſoils—gravel, highway earth, very ſmall ſtones, coal-aſhes, ſoaper's-drains, and pig's-dung.

For cold wet lands, no manure effectual without draining, and then the ſame as for the laſt.

For ſtone-braſh land, any kind of manure laid on in a half-rotten ſtate. The quantity per acre muſt be learned from experience. It is better to lay on at twice than too much at once. The ſeaſon from February to September. The time of laſting is according to the under-ſtratum, which, if compact and warm, will render the manure durable; if looſe, or a cold clay, it will ſoon be gone.

To the Fourth.—No new diſcovery of manure in the ſouth parts of Glouceſterſhire, except about Briſtol. The dung and urine of pigs, fatted by the waſh of the diſtillers, are found to be excellent manure for any kind of land, but more eſpecially cold clays. The lees or ſuds of ſoap-makers are alſo found of great uſe, as well as the urine of pigs, by being ſprinkled over paſtures in the ſame manner as the roads are watered about London. Care muſt be had to due quantity, or the verdure will be deſtroyed. Experience is the beſt guide.

To the Fifth.—All dreſſings on cold wet lands will be ineffectual, unleſs the lands are firſt dried by under-draining. Soot is the moſt beneficial, only the hay will ſmell of it.

To the Sixth.—Stone is the beſt and moſt laſting; wood is a ſubſtitute, and will be laſting alſo, if conſtantly wet; if not, it will ſoon be rotten, and then the trenches will cloſe.

To the Seventh.—The wood which ſtands beſt againſt weſt winds, on high expoſures, is the beech and the black mountain ſallow, (*Salix Latifolia Rotunda*, being the thirteenth ſpecies of Miller) with a plumb-tree leaf; on mooriſh and boggy-ground, the black alder.

To the Eighth.—Lucerne is cultivated by very few, and thoſe more for fancy than for profit.

Sainfoin is cultivated on dry, gravelly, and ſtone-braſh land, when the under-ſtratum is not of a cloſe compact texture, but of a looſe open ſtony nature, or chalky. It anſwers well in the broadcaſt method.

Burnet grows naturally in moiſt clay meadows, in this county; but the cattle will prefer almoſt all other common plants found in thoſe paſtures to it. The leſſer Burnet (or *Pimpernella Sanguiſorba minor hirſuta* of C. B. B. and *Poterium* of Linnæus) delights in a gravelly dry ſoil, and is frequent in healthy ſheep-paſtures, and eaten greedily by thoſe animals.

To the Ninth.—Turnips are generally ſown as a fallow crop, after the land (of any ſort) is well-tilled, cleanſed from weeds, and dreſſed with yard-dung, lime, or any compoſt. We generally ſow them about Midſummer, and hoe them twice; they may be effectually preſerved from the fly, if, as ſoon as the ſeed leaf appears, wood-aſhes be ſown over them as often as it is waſhed by dews or rains.

To the Tenth.—The drill is preferable to the broadcaſt method, in looſe or loamy land; but not in clays or ſtony ſoils.

To the Eleventh.—The comparative advantage of oxen is great where they are bred by the farmer who uſes them, and fed on commons in ſummer, and on ſtraw in winter, till three years old, (but not ſo much where they are bred in incloſed lands, or bought at four years old) and worked till ſix or ſeven; they are leſs liable to ſickneſs than horſes; and if accidents befal them, they are of ſome value. Two oxen will do more work than one horſe of equal value with them, nearly in proportion as ſix to four, and they coſt leſs in keep.

To the Twelfth.—In places ſubject to rot ſheep, fold them before the dew falls, and keep them in fold till it exhales, in ſpring and ſummer; in winter attend to this as much as the weather will admit; and feed them in the fold, or on turning out, with hay on which ſalt has been ſprinkled at ſtacking up at harveſt. It is a known truth, that the paſtures (though marſhes) which are overflowed by the ſalt water at the vernal or autumnal high tides, never rot ſheep, but are an antidote to the diſeaſe, if the infected are depaſtured thereon while the diſeaſe is recent.

To the Thirteenth.—Chiefly in the croſs-tree, pot-hook-drail, ſwing-plough, which with two horſes will plough moſt kinds, and with three horſes any ſort of land; having a point to the ſhare for ſtony lands, and no point in lands that are not ſtony.

Anſwers to the Society's Queries respecting the County of Kent.

[By the Rev. Mr. Hill, of Eaſt-Malling.]

Anſwer 1ſt. Our beſt crops are generally obtained from hazel loams; and if they are ſomewhat ſtiff and inclining to clay, the better. On ſuch lands, the uſe of heavy large harrows and rollers in the ſpring, to break and pulverize the ſoil, cannot be too much recommended. When the lands are ſo pulverized, we frequently get of wheat from four to five quarters, beans from five to ſeven quarters, barley and oats 6 and often 7 quarters per acre.

Ans. 2d. Our beſt lands never lie fallow; and the order of our crops is, 1. Wheat, 2. Barley, or Oats; 3. Peaſe, or Beans; the latter always in rows, hand-hoed twice with a two-inch hoe near and between the beans, horſe-hoed twice, and laſtly earthed with a horſe-hoe. After the beans are off, we plough ſhallow with a broad ſhare, and harrow up, and burn the weeds if any remain, thus preparing a good tilth for wheat

On our ordinary, ſandy, or ſtone ſhattery [ſtone braſh] land, our courſe of crops is different.—1. Wheat.

After that, (*before Michaelmas*) ſow winter vetches or rye, and eat them off with ſheep and bullocks in the ſpring.

Then plough for turnips three or four times, each time harrowing off and burning the weeds; then lay on forty cart-loads of dung per acre. We always carefully hand-hoe the turnips, as the charge is amply repaid by the crop. Sometimes, in a kindly ſeaſon, we get a good crop of turnips after early peaſe.

Oats and barley will produce (eſpecially oats) from five to ſeven quarters per acre, after a good turnip ſeaſon, and the crop well fed off with ſheep, eſpecially if good hay and oil-cake be given them at the ſame time. With barley and oats we ſow clover; next year wheat, and laſtly turnips.

Ans. 3d. On ſtiff clays or ſand, or gravelly cold wet land, lay marle or chalk early in the winter, at the rate of eighty cart-loads per acre, which will laſt twenty years; beſides this, dung and lime is ſometimes added.

Ans. 4th. Dung made by fat bullocks fed on hay and oil-cakes, and by ſheep fed on the ſame or turnip lands. Large oxen will eat twenty pounds of oil-cake per d[illegible] Welch heifers will thrive well with half the quantity.

Ans. 5th. Wood-aſhes, coal-aſhes, with fowls or p[illegible] dung ſpread thin.

Ans. 6th. Ragged ſtones or brick-bats, or rather flat ſtones, two ſet on edge eight or ten inches aſunder, and a third over; and where theſe cannot be had, black-thorn or other buſhes. Some perſons uſe turf with the graſs ſide downwards; leaving a hollow below for the water.

Ans. 7th. Scotch firs on bleak barren ſoils, eſpecially in a northern aſpect. On cold ſwampy bogs, the Dutch willow will do great things; but aſh will ſucceed better, and is far more uſeful and profitable.

Ans. 8th. Lucern ſucceeds beſt in drills one foot aſunder,* and kept clean by a ſmall plough drawn by one horſe. Sainfoin flouriſhes moſt on chalky, and dry ſtone ſhattery land; on which it will produce two tons per acre on an average, for fourteen or fifteen years. Burnet is in diſgrace with us, and generally laid aſide as uſeleſs.

Ans. 9th. The firſt part of this query is anſwered in the ſecond. To prevent the ravages of the fly, ſome good is ſometimes done by running a light roller over them, with a bundle of black thorn faſtened behind it.

Ans. 10th. When lands are foul and weedy, the drill is certainly preferable to the broadcaſt; as by that means, the horſe-hoe may be uſed.

Ans. 11th. Where a farm conſiſts of arable land and good paſture, the uſe of oxen is deemed preferable to that of horſes, where men can be procured to drive them.

Ans. 13th. Our improvements in implements of huſbandry have of late years been great and various, particularly in drill ploughs, which, by dropping the ſeed regularly, and depoſiting it at a proper depth, [illegible] Of carts we have a great variety, ſome for dung, ſome for [illegible] with two wheels for two horſes, and three wheels for one horſe; and others of lighter ſorts.

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* We apprehend a diſtance of at leaſt eighteen inches would be better, and occaſion leſs damage to the plants by the horſe going between the rows. From various experiments made to aſcertain the beſt diſtance between the rows of lucern, the fineſt and heavieſt crops have been from rows two feet apart.

Having ſent your queries to a very ſkilful farmer, from whom I received the following anſwers for one of [illegible] —

To the firſt Query. We have moſt wheat, beans, and vetches, if in proper tilth, from ſtiff land. The moſt barley, peaſe, and oats, from a lighter ſoil. Wheat on an average twenty-eight buſhels per acre. We ſow three buſhels.

One ſack of barley ſown per acre produces five quarters after turnips. Five buſhels of peaſe per acre produce from three to four quarters. Four buſhels of beans, and five buſhels of oats per acre, produce from five to ſix quarters.

Vetches, &c. fed off, make a good wheat ſeaſon.

2d Query. A clean fallow, and ſown with clover, after clover, wheat or beans, the enſuing ſpring, in one earth. Turnips on four ploughings and dunged; hand-hoeing twice. Then barley and clover; next wheat.

3d Query. Our beſt manure is dung from beaſts fatted with oil-cakes, and fit for all ſoils. We lay on forty cart-loads per acre, each cart holding thirty buſhels of coal, which, for turnips or wheat, will laſt ſix years.

5th Query. Wood aſhes are the beſt, and will kill ruſhes.

6th Query. Green alder poles, ſuch as we uſe for hops, ſixteen or eighteen feet long, two at the bottom and one at the top; or green black-thorn covered with heath, or looſe ſtones, will do.

7th, 8th, and 10th Queries. The ſame anſwers as from Mr. Hill.—*9th Query*. Four Ploughings, forty cart-loads of dung, and hoe twice.—*12th Query*.—Kill your ſheep as ſoon as the rot appears.

A Chart of the NORFOLK HUSBANDRY, *on a light Farm of Twelve Fields*

Fields.	1778.	1779.	1780.	1781.	1782.	1783.
1.	Turnips, 5 Ploughings.	Barley, 3.	Clover.	Wheat, 1.	Oats, 1.	Turnips, 5.
2.	Barley, 3.	Clover.	Beans, 1.	Wheat, 1.	Turnips, 5.	Barley, 3.
3.	Clover.	Peaſe.	Wheat, 1.	Turnips, 5.	Barley, 3.	Lay.
4.	Wheat, 1.	Oats, 1.	Turnips, 5.	Barley, 3.	Lay.	Lay.
5.	Oats, 1.	Turnips, 5.	Barley, 3.	Lay.	Lay.	Lay.
6.	Turnips, 5.	Barley, 3.	Lay.	Lay.	Lay.	Wheat, 1.
7.	Barley, 3.	Lay.	Lay.	Lay.	Beans, 1.	Wheat, 1.
8.	Lay.	Lay.	Lay.	Wheat, 1.	Oats, 1.	Turnips, 5.
9.	Lay.	Lay.	Wheat, 1.	Oats, 1.	Turnips, 5.	Barley, 3.
10.	Lay.	Peaſe, 1.	Wheat, 1.	Turnips, 5.	Barley, 3.	Clover,
11.	Wheat, 1.	Oats, 1.	Turnips, 5.	Barley, 3.	Clover,	Peaſe, 1.
12.	Oats, 1.	Turnips, 5.	Barley, 3.	Clover.	Wheat, 1.	Oats, 1.

Soil; being the best regular Course of Crops on a Arable for Twelve Years.

1784.	1785.	1786.	1787.	1788.	1789.
Barley, 3.	Lay.	Lay.	Lay.	Peaſe, 1.	Wheat, 1.
Lay.	Lay.	Lay.	Wheat, 1.	Oats, 1.	Turnips, 5.
Lay.	Lay.	Wheat, 1.	Beans, 1.	Turnips, 5.	Barley, 3.
Lay.	Wheat, 1.	Peaſe, 1.	Turnips, 5.	Barley, 3.	Clover.
Peaſe, 1.	Wheat, 1.	Turnips, 5.	Barley, 3.	Clover.	Wheat, 1.
Oats, 1.	Turnips, 5.	Barley, 3.	Clover.	Wheat, 1.	Oats, 1.
Turnips, 5.	Barley, 3.	Clover.	Wheat, 1.	Peaſe, 1.	Turnips, 5.
Barley, 3.	Clover.	Beans, 1.	Wheat, 1.	Turnips, 5.	Barley, 3.
Clover.	Beans, 1.	Wheat, 1.	Turnips, 5.	Barley, 3.	Lay.
Wheat, 1.	Oats, 1.	Turnips, 5.	Barley, 3.	Lay.	Lay.
Wheat, 1.	Turnips, 5.	Barley, 3.	Lay.	Lay.	Lay.
Turnips, 5.	Barley, 3.	Lay.	Lay.	Lay.	Wheat, 1.

A Chart of the NORFOLK HUSBANDRY *on a* *of Crops*

Fields,	1778.	1779.	1780.	1781.	1782.	1783.
1.	Turnips, *	Barley.	Clover. †	Wheat.	Oats.	Turnips *
2.	Barley.	Clover.	Wheat.	Oats.	Turnips.	Barley.
3.	Clover.	Peaſe.	Oats.	Turnips.	Barley.	Lay.
4.	Wheat,	Oats.	Turnips.	Barley.	Lay.	Lay.
5.	Oats,	Turnips,	Barley.	Lay.	Lay.	Beans.
6.	Turnips,	Barley.	Lay.	Lay.	Beans.	Wheat.
7.	Barley,	Lay.	Lay.	Beans.	Wheat.	Turnips.
8.	Lay.	Lay.	Beans.	Wheat.	Turnips.	Barley.
9.	Lay.	Beans,	Wheat.	Turnips,	Barley.	Clover.
10.	Beans.	Wheat.	Turnips.	Barley.	Clover.	Wheat.
11.	Wheat.	Turnips.	Barley.	Clover.	Wheat,	Oats.
12.	Turnips,	Barley.	Clover.	Wheat.	Oats,	Turnips,

Heavy Soil; being the best regular Course for Eleven Years.

1784.	1785.	1786.	1787.	1788.	1789.
Barley.	Lay.*	Lay. ‡	Beans.	Wheat.	
Lay.	Lay.	Beans.	Wheat.	Turnips.	
Lay.	Beans.	Wheat.	Turnips.	Barley.	
Beans.	Wheat.	Turnips.	Barley.	Clover.	
Wheat.	Turnips.	Barley.	Clover.	Wheat.	
Turnips.	Barley.	Clover.	Wheat.	Oats.	
Barley.	Clover.	Wheat.	Oats.	Turnips.	
Clover.	Wheat.	Oats.	Turnips.	Barley.	
Wheat.	Oats.	Turnips.	Barley.	Lay.	
Oats.	Turnips.	Barley.	Lay.	Lay.	
Turnips.	Barley.	Lay.	Lay.	Beans.	
Barley.	Lay.	†Lay.	Beans.	Wheat.	

Explanation of the preceding Tables.

IN the firſt table the figures in the ſquares expreſs the number of ploughings.

The two crops after the *lays* and *clover* may be varied according to the ſeaſon, or the ſoil, by the diſcretion of the farmer. And where bullocks are fatted with ſtraw and turnips only, this plan will be more productive of profit to the farmer, and benefit to ſociety, than any other yet diſcovered; experience having ſhewn, that two hundred acres of land, half in tillage, and half natural graſs, will keep as many cattle as the whole would do all in natural graſs; by this means, therefore, all the produce of corn (labour deducted) is clear gain, and the land cannot be injured thereby.

It is to be noted, that the turnips are twice hoed, and not left nearer than fourteen or ſixteen inches to each other; that they muſt not be fed, but drawn, carted, and given to the bullocks in a ſtraw yard, or ſome other place convenient for preſerving the manure.—Beans muſt alſo be twice hoed, and in very wet ſeaſons three times, if wheat is to follow them. Peaſe are an uncertain crop, and often fill the land with weeds.

The two capital crops, wheat and barley, in theſe tables, come twice in the courſe,—the turnips twice,—the broad clover only once; by which means the different plants are thrown at ſuch a diſtance from each other that (ſeaſons permitting) it is impoſſible to fail of good crops; and the worm, which is produced by frequent repetitions of broad clover, and is certain deſtruction to that plant and the ſucceeding crop, is prevented.

This mark * ſignifies, that from twenty to forty cubic yards of rotten dung per acre, is to be lain on immediately before the laſt ploughing.

This †—that a like quantity of compoſt, the mixture two parts ditch-ſcourings, mould from borders, or almoſt any kind of earth, and the other part dung. This ſhould be heaped, and in the courſe of two years turned over three times, to mix it well, and deſtroy the weeds. Lay it on the clover in the ſpring.

And this mark ‡ denotes a covering of marle, eighty cubic yards per acre. The lay is to be fed the laſt year, ſo that it may be covered in the interval between hay and corn harveſt.

Wheat, after the clover lay, ought always to be *ſet*.

Wheat-ſtubbles are never ploughed in, but raked up and carted to the ſtraw-yard.

When the turnips fail, plough the land into yard ridges, water-furrow it well, and let it lie for barley next year.—This is excellent huſbandry, and greatly preferable to a wheat crop after the fallow.

The beſt method to preſerve turnips from the fly is, to take one pint of new ſeed, and ſteep it in water five or ſix hours, then mix it with another pint of new ſeed unſteeped, and a pint of ſeed of the year before; by this method the plants will come up at three different times; and as the fly always ſeizes the youngeſt plants, it ſeldom happens but that enough of each growth will be left for a crop; one pint of ſeed being ſufficient for an acre, could it be properly diſtributed. In purſuing this method, I never loſt a turnip crop.

Turnips, with chaff, and the ſtraw of barley, oats, or peaſe, are excellent food for horſes, provided the ſtraw be freſh threſhed, and given to them as they want it.

Galloway Scots, four years old, or almoſt any beaſt of that age, taken into the ſtraw-yard in October, and well attended with good ſtraw and turnips, will be fat by the April following. An acre of good turnips is ſufficient for a beaſt of forty ſtone, fourteen pounds to the ſtone. The beaſt here alluded to are ſuch as are brought to the fairs in tolerable condition.

Obſervations made in a Tour into Suffolk and Surry,

[By R. Proctor Anderdon, Eſq.]

THE end of March 1788, I viſited Mr. Young at Bradfield-hall, where I ſaw, in a large field before his houſe, about three acres of cabbages, very clean and well managed; and in the ſame field, divided by hurdles, turnips, and ſheep feeding on them: one or two cloathed, to improve their wool: on that part of the field where the turnips had been eaten off, the ground was turning up for barley, and three ploughings were intended, as well as for that part where the horſe-hoed cabbages were, as for that where the hand-hoed turnips grew.

Mr. Young's courſe of crops, on ſandy loam or gravel, is,

1. To manure for cabbages or turnips.
2. Plough thrice, after either of them, for barley.
3. Clover. 4. Beans. 5. Wheat.

His quantity of manure for an acre of cabbages or turnips is forty-one horſe-put loads per acre. He lays out his ground on two-rod ridges. On wet loam, upon clay, 9s. per acre, after a moderate ſprinkling of dung, or other manures, he dibbles on one earth on the middle of the flag, nine inches aſunder, two buſhels an acre of the ſmall black,

1. Horſe-beans. 2. Wheat, with
3. Clover, or other graſſes.

He pays 3s. per buſhel dibbling beans.

Mr. Young carries all his hay and corn in one-horſe puts or carts, with a waggon-like apparatus on the body; and thinks them more commodious than waggons.

His ſheep-fold, for winter, for a hundred ſheep, is littered with wheat-ſtubble daily in rainy weather, or as often as is needful. It is partly under cover, where are racks for hay. He ſeldom gives them turnips there; they are put in late in evenings, and out early in mornings, in dry weather. In wet they have hay always; and turnips only in very ſnowy or ſtormy weather; depending moſtly on hay in the fold.

A farmer would do well to learn of Mr. Young to make more dung than ordinary, and better. He lets his dung-heaps lie dry at bottom, daily throwing upon them the water of the cattle, having ſhoots to carry off the rain from the hanging roofs of his ox-ſtalls, entirely out of the court, without carrying off any of the richneſs of the dung. He has gutters behind his cattle in the ſtalls, which convey their water into reſervoirs made convenient for receiving it, to be thrown upon the dung. In April, in warm ſhowery weather, he turns over his dung, a boy ſtanding by with a baſket of ſalt, ſtrewing at the rate of one pound of ſalt to a cubical yard of dung. He has alſo a cowl, or veſſel on wheels, to remove the refuſe of the houſe (duſt, &c.) to the farm-yard, which affords ſeveral good loads of manure a year.

The weight of his ſmall weighing-coop is 1 cwt. 5 lb. The ſteelyard was made on purpoſe. The expence of the machine was 26s. It will weigh an animal, or any thing not exceeding 6 cwt.

When turnips are taken up to clear the ground for Lent-crops, it is uſual about Bury to cut off the tap-roots, and place the turnips on the ground in a dry paſture, ſide by ſide, till wanted. The green is left, and put uppermoſt. But the green is rarely conſiderable in lands well adapted to turnips, as they are in that neighbourhood, in compariſon to what it is in heavy and ſtrong lands, not very ſuitable to turnips, where they run more to green, and leſs to apple.

It is well known, that, about Bury, they plough with two horſes or oxen abreaſt, without a driver.

But being ſtruck with the greater novelties in the mode of huſbandry of Mr. Mure of *Great-Saxham*, with whom we paſſed the greater part of two days, I cannot refrain from being ſomewhat more particular with reſpect to it. He fats about 180 black cattle a year; many of them Scotch and Welſh, feeding them in ſtalls all the ſummer, by cutting and carrying to them meadow graſs, vetches, &c. In winter he gives them a peck a day of malted beans. He alſo feeds them with malted barley; potatoes; cabbages, and chaff or ſtraw cut; turnips, and ſtraw not cut; bean-meal and water; barley-meal and water; dry bean-meal, dry barley-meal, and, *then*, they are led to water twice a day.

Mr. Mure has erected a circular building for feeding 46 head of cattle, tied up at $3\frac{1}{2}$ feet aſunder, outſide of the circle, with covered reſervoirs in the centre for depoſiting fodder, in inclement weather more eſpecially. The whole was fitted up at a ſmall expence, being made of the thinnings of his fir plantations, and covered with thatch; the cribs wattled or wreathed. The poſts, to which the cattle are tied, very little above the crib. A gate leads into the central part, where there is a way for carts and waggons to go round within the circle between the ſtalls and reſervoirs for fodder; he makes the greateſt proviſion for dung I ever ſaw, by his ſtall-feeding all ſummer, cutting and carrying tares, graſs. &c. to his cattle, and bedding them with ſtraw or ſtubble, All the water of his cattle is ſaved, and daily thrown on his dunghills, as well as Mr. Young's.

Mr. Mure plants cabbages earlier than ordinary for food for his cattle. He was planting a field when I was there, which was the laſt week in March, in rows wide enough for horſe-hoeing, at 20 inches aſunder in the rows.

He has a machine for weighing large cattle, which coſt him fifteen guineas, beſides the building to cover it, &c. Alſo a machine for grinding potatoes, worked generally by hand, but may be worked by a horſe; it is a broad nine-inch wheel, turned in and round a wooden frame, in the manner of grinding bark.

Shortly before I was at Saxham, a bet of a rump and dozen had been determined between Mr. Mure and Mr. Macro; the bet was made at a farmer's club, on the queſtion, Whether turnips drilled and horſe-hoed, or ſown broadcaſt and hand-hoed, would produce the beſt crop? Mr. Mure was on the ſide of horſe-hoeing, Mr. Macro in favour of hand-hoeing; and the point was tried on a field of Mr. Mure's prepared for turnips, which was divided for the purpoſe, and the crops put in ſide by ſide, the length of the field, each party taking care of the crop, according to his adopted plan. After the bet was determined, I had the ſatisfaction to ſee the field of experiment, where the broadcaſt part appeared to the eye as good as the drilled; but I underſtood

	Tons
The produce of the drilled crop per acre was - -	14½
Of the broadcaſt - - - - - - - - -	10
Superiority of the drilled per acre - -	4½

Upon which Mr. Macro reſolved ever after to drill and horſe-hoe his turnips, and procured the proper apparatus for that purpoſe; but unluckily did not live to carry his intentions into execution.

Mr. Duckitt's farm at Eſher is the moſt complete, and kept in the cleaneſt and beſt order, of any I ever ſaw. He ploughs his lands into beds wide enough to contain nine or ten rows of the crop ſown in it, at nine inches aſunder, for the moſt part. His farm at Eſher is about 500 acres, of which nearly 400 are arable. The land is moſtly ſand on a gravel bottom; but ſome of it clayey, and moſt part of it heavy enough for beans, at leaſt for the ſmaller ſort, tick or horſe-beans. He drills, on his beds of nine or ten rows, wheat, barley, oats, rye, barley, and clover, at nine inches aſunder; tares or vetches, oats and tares, rye and tares, peaſe and turnips, at eleven inches aſunder; beans at eighteen inches aſunder. After the ground is well prepared by ploughing, he makes five channels or drills with a drill-plough, with as many ſhares and broad-boards; then his dropping-machine follows, and ſheds five rows of ſeeds, which are covered by an harrow.

When the crop is high enough for the purpoſe, he has two horſe-hoes, which hoe five alleys or intervals apiece, and have each a man to hold and guide them. They work one on each ſide of the furrow, which divides the beds, into which the field is thrown; of courſe hoeing at once five rows on each bed, or two half beds. The horſe is led in the furrow by a boy, and by the help of a long whipple-tree draws both the horſe-hoes, which completely hoe the ten alleys. When the land is more than ordinarily dry and hard, two horſes are neceſſary for the work. But wet or dry, no injury is thereby done to the crop, the horſes always going in the furrow. He has ſome horſe-hoes with ſix ſhares, each of courſe hoeing ſix alleys at a time.

I had the ſatisfaction to find Mr. Duckitt ſowing a field of eleven acres with turnips. It is amazing with what expedition he proceeds; his field was perfectly ploughed and harrowed; and he carried on his work, according to his uſual method when he works with two-drill ploughs, by beginning in the middle of his field. One drill plough branched off one way towards one ſide hedge, the other worked oppoſite to it, and tended towards the oppoſite hedge. The drills ſoon worked on faſt enough for the after-work, and were followed by two dropping machines, going in the tracks made by the drill-ploughs, and there dropping the turnip-ſeeds. After them went a double-zull, or what is there called a ſtrike-furrow plough, to ſtrike up furrows, to throw the work into the beds of ten rows of turnips each, which were dropped at eleven inches aſunder. And then followed two horſes, one on each ſide of the bed, in the furrows, which, by means of a long whipple-tree, as long as the width of the beds, drew three light harrows fixed to the whipple-tree, that covered the whole breadth of the bed, and harrowed the whole as it went on. Each harrow had five rows of tines or teeth, and ſix tines in each row, making ninety in three harrows; it being neceſſary that the harrows ſhould be cloſe enough only to cover the ſeed, and not to ſink deep enough to diſplace the ſeed, after it falls from the dropping-machine.——Mr. Duckitt's farm implements are moſtly, if not all, of his own invention. It would be a great improvement to agriculture, if they were diſperſed all over the kingdom. Thoſe adapted to preparing the ground, putting in, and cultivating the crop in its growth, would coſt about 30l. I have got what he calls his trenching-plough, with his ſkim-coulter, and his bean horſe-hoe with two ſhares. They coſt me on the ſpot nine guineas and a half, and home eleven pounds thirteen ſhillings.

It may not be improper to explain the ſkim-coulter. It is calculated for lay ground; in its work it precedes the other coulter, turning the flag down, which, by the other coulter following, is ſo completely covered, that the edges do not appear and produce weeds and graſs as in common ploughing. It is fit for turning up lay for a bean crop, for which purpoſe I have uſed it to advantage.

Brief account of the NORFOLK HUSBANDRY,

[By a Gentleman near Norwich.]

ABOUT ſixty years ſince, a great part of this county was ſheep-walks, rented only at about eighteen-pence an acre; and even within my memory, many thouſand acres were in this ſtate, which now are turned into the fineſt farms, and let at twenty ſhillings per acre.

The late amazing improvements may be attributed to various cauſes. Amongſt others, the following have not been the leaſt operative. Incloſing our heath and waſte lands; folding ſheep; and the moſt extenſive uſe of marle and clay, on ſandy ſoils eſpecially. By the general introduction of turnips, well hand-hoed; of clover, ray-graſs, and buck-wheat, and an excellent courſe of crops.

The uſual courſe of crops among our greateſt and beſt farmers, is, 1. Turnips; 2. Barley; 3. Clover, or clover and ray-graſs; 4. Wheat. This courſe has of late years become very general, and keeps the ſoil clean. We manure for turnips if poſſible, and alſo for wheat. Sometimes our clover is extended to three years, but not frequently. Our farmers agree in the opinion, that if turnips are ſown on a well-conditioned fallow, and twice hoed, and the land ploughed three times for barley, the clover may remain at leaſt two years without giving a foul crop of wheat, eſpecially as our wheats, on clover lays, are of late almoſt wholly ſet, and more eaſily kept clean than when ſown broad-caſt.

The Norfolk huſbandry is, as Mr. Young has juſtly obſerved, quite a ſyſtem, every ſucceſſive part of which is dependant on the foregoing, and therefore it will not admit of much variation.

We generally mow the firſt and ſecond growth of clover; not merely on account of the hay, but becauſe by repeated experience we are convinced the wheat which follows is far better than it would be after feeding.

Soaper's aſhes are laid on ſtrong wet lands with great ſucceſs; and alſo on paſtures, as a top-dreſſing in the beginning of April.——Malt-duſt and ſoot are uſed on meadows, and anſwer well: the latter is purchaſed at high prices from Norwich.——The winter food of cows is chiefly turnips and ſtraw, in the farm-yards, which are kept well littered with chopt ſtubble and ſtraw.

We reckon ſix horſes neceſſary for one hundred acres of arable; and with two in a plough we till two acres in a day, five or ſix inches deep. Stubbles for fallow are ploughed in during autumn—this alſo deſtroys the weeds.

A good dairy-maid with us will take proper care of 20 cows; and to every cow our beſt farmers keep one hog.

The common mode of eſtimating the expence of taking a farm is, that three rents will about ſtock it, or four very completely.

In ſome parts of this county conſiderable quantities of cole-ſeed are raiſed; we hand-hoe it like turnips, and by that means nearly double the value of the crop.

Near the coaſt great quantities of ſea-weed, or ooze, are collected, and uſed as manure to good purpoſe. We mix it in compoſt with earth and lime, or marle and dung, for one year, and then lay it on arable land.

Two-wheeled ploughs are uſed in general, as being moſt eaſy and expeditious; but in heavy lands they uſe ſwing-ploughs, and two horſes always do the work.

On Divers Articles of Norfolk Husbandry.

[By Sir THOMAS BEEVOR, Bart.]

WE have neither hit upon, nor indeed attempted any other courſe of crops on our ſtrong heavy lands than thoſe we practice on our light ſoils. Turnips well hoed twice are equally cultivated upon both, and without any material inconvenience to the farmer, or injury to the land. On the light ſoils, we feed them off with ſtock in the field where they grow: On heavy wet lands, we draw them and carry them off in light carts, to be eaten either in ſome graſs or unploughed ſtubble field, or in the houſes or yards at home.

I prefer the latter practice much, and have always uſed it, although the greater part of my farm would very well admit of feeding them where they grow. My reaſons for preferring this latter method are, that there is no waſte of the turnips;—that the food comes equally freſh to the beaſts every day;—that the protection from cold and wet weather, which the cattle enjoy in houſes, or well fenced and ſhedded yards, (as mine are) contributes very much to their health and fattening, (much more ſo, indeed, than is generally conceived;) and that by this means I collect and preſerve all their dung to be laid on ſuch fields, and at ſuch times, as will be moſt beneficial to the enſuing crops. Theſe advantages are all loſt in the method of feeding off the turnips on the fields; for even half the dung of the beaſts, feeding in the fields in the depth of winter, is loſt by being dropt under the hedges or trees, to which after filling themſelves, they flee for ſhelter and warmth.

The expence of carting away an acre of turnips depends on the goodneſs of the crop, and is from ten to fifteen ſhillings; which, although it is much more than ſaved in the preſervation of the turnips from waſte, yet induces the covetous and indolent to feed them off the land; for they flatter themſelves they have no waſte while they have lean ſheep or bullocks, which will eat up the offal that the fat ones have left; not conſidering how much better their ſecond or lean ſtock would thrive with clean and freſh food.

You aſk me, if beans and wheat, alternately, would not obviate the neceſſity of fallowing heavy lands, and prove for a conſiderable length of time a beneficial mode of cropping the ground. As I have not experienced the practice, I can only conjecture, and tell you, that ſome little time ſince I intended to have tried the experiment on two pieces of ſtiff wet ground, which I have laid to graſs; and that I have very little doubt but that, if the bean crops be ſometimes manured for, and always well hoed, this mode would be a moſt profitable one, and, for any reaſon I can ſee to the contrary, might endure for ever; but ſtill, as it does not raiſe winter food for cattle, I muſt, for the ſake of their dung, prefer turnips to it, wherever they can be raiſed.

Various Articles of Eſſex Huſbandry.

[By the Rev. Mr. Onley; Aug. 14th, 1784.]

I AM confident that in general, for any beneficial purpoſe, grazing is the farming of gentlemen. But where, as with us, hay ſells high, it is neceſſary, and probably in general more profitable, to have one-fourth of the land in four fields arable, for a ſupply of winter and ſpring artificial paſturage. The coach-horſes of any private family, without any material reſtraint, will [illegible] one good *farming-ſervant*; and the heavy expence of many inbourers, and a team, which none but a mere farmer can manage to any œconomical purpoſe, and whoſe attention for a neceſſary return muſt continually be applied to matters of the *loweſt* kind, will be avoided.

In the diſpoſal of ground, (and even little men, avoiding the expenſive whims of taſte, may fairly attend to this, as it leads to that gardening neatneſs, on which *profitable* farming depends) a field or two of perfectly hoed crops form in the ramble a neceſſary contraſt to the grazing grounds, and with good low hedges, a few clumps of plantation, and, if without material expence it can be had, a little water, make together on any ſpot, without woods, lawns, lakes, or temples, an ornamented farm within the reach of every country gentleman, who may ſatisfy his honeſt pride, and not injure (nay probably improve) his fair income.

Our farmers cultivate one hundred acres of ſtrong, moiſt, arable land, at the expence of four moderate horſes only;* plough with a pair a-breaſt an acre a day, and riſe clover enough for ſummer; and, by two or three hoeings, turnips enough for winter, to maintain probably as many cattle as in the beginning of this century were fed on their whole farms; many of which, I apprehend, were then little more than rough cow-paſtures. Our medium crops, about three quarters of wheat, four quarters of barley and oats, three quarters of beans and peaſe, per acre. Rent, rates, and tithe, about 1l. 1s. per acre.

That oxen on ſmall farms and incloſures would not anſwer for work, I believe; nor would the ſaving from the fattening them afterwards be ſo great as at firſt ſeems probable; but on large farms and heavy cartage, they muſt be very profitable, comparatively with an expenſive team of horſes.

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* Many of our correſpondents doubt whether four horſes can properly cultivate one hundred acres of moiſt arable land, as the time for working the fallows is often much ſhortened by the precariouſneſs of our climate.

A courſe of crops of twenty-one years, beginning and ending with a compleat Fallow, with the produce, and its value per acre.

Crops.	*Produce per quarter.*	*Value.*		
Fallow		£.	*s.*	*d.*
1. Barley	5 quarters at 1l. per qr.	5	0	0
2. Clover	per acre - - -	2	0	0
3. Wheat	3 at 2l. - - -	6	0	0
4. Turnips	per acre - - -	[*]2	0	0
5. Oats	4 at 15s. - - -	3	0	0
6. Beans	3 at 1l. - - -	3	0	0
7. Barley	4 at 1l. - - -	4	0	0
8. Peaſe	3 at 1l. - - -	3	0	0
9. Wheat	3 at 2l. - - -	6	0	0
10. Winter-tares	per acre - - -	2	0	0
11. Barley	4 at 1l. - - -	4	0	0
12. Clover	per acre - - -	2	0	0
13. Wheat	3 at 2l. - - -	6	0	0
14. Turnips	per acre - - -	2	0	0
15. Oats	4 at 15s. - - -	3	0	0
16. Peaſe	3 at 1l. - - -	3	0	0
17. Wheat	3 at 2l. - -	6	0	0
18. Winter-tares	per acre - - -	2	0	0
19. Barley	4 at 1l. - - -	4	0	0
20. Beans	3 at 1l. - - -	3	0	0
21. Wheat	3 at 2l. - - -	6	0	0
Fallow				
	In 23 years—Total	£.77	0	0

Or, within a ſhilling, 3l. 7s. per acre per annum.

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[*] The value of turnip crops in Eſſex is generally 3l. ſometimes more, per acre.

On light lands, turnips, barley, clover, and wheat, [*the Norfolk courſe*] form a moſt profitable ſucceſſion; but in time even *theſe* lands ſeem ſurfeited, with the clover at leaſt; and trefoil, and ray-graſs, are obliged to be uſed to gain a ſwarth. With us wheat at every fourth, or certainly every fifth year, is thought a neceſſary profit.

Essex Mode of cultivating and applying Potatoes, Carrots, Winter Vetches, &c. &c.

[By the Same; Jan. 5, 1786.]

POTATOES (of which you propoſe ſome queries to me) I have tried on a very trifling ſcale, among the intervals (for the firſt two years) of a little plantation. By working the ſoil, their vegetation encouraged that of the young trees, and the produce amply paid for every attention to the ground.

For *ſmall* pork, when baked or boiled, mixed with a little barley-meal, we have found them excellent; but for *large hogs*, they are moſt profitably given raw, if theſe have at the ſame time the ſhack of the barn-door in threſhing ſeaſon, or occaſionally a few beans; and may thus be brought forward at a cheaper rate, for—what, we think, will alone make large meat and firm bacon—peaſe and barley-meal.

We have tried them in bread: it was excellent, but the loſs of weight in baking, and the time and delicacy of the proceſs, rendered this, as it indeed does moſt of theſe things, far from eligible œconomy for the poor.*

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* The moſt œconomical uſe of potatoes, both for rich and poor, is to eat them plain boiled. For cattle they will do raw; but for hogs, boiling is preferable.

In this part of Eſſex, on a whole year's fallow after wheat, barley is generally ſown; and by the produce of at leaſt one quarter more in quantity, (on a medium five quarters per acre) and its ſuperior quality, it is ſuppoſed to pay for the omiſſion of any hoeing crop that might have preceded it. But this very land, which requires ſuch delicate and expenſive proceſs for barley, will, without the fallow, (with the admiſſion of peaſe, beans, or turnips) produce an *equal* quantity of oats.

I am from experience convinced, that an acre of carrots will double in the quantum, of equally hearty provender, the product of an acre of oats; and from the nature of their vegetation, the nice mode of cultivation, and even of taking them up, (all of which, expenſive as they are, bear a very inferior proportion to the value of a medium crop) muſt leave the land, eſpecially if taken off it in an early period, ſo mellow for the plough, as to form a ſeed-bed for barley, equal to any fallow tilth.

I mention only horſes, becauſe for them a ſubſtitute is chiefly wanted. For other cattle, we have a variety of winter vegetables, but none (as far as my ſmall trials extend) that wear the ſoil ſo little, prepare it for the following crop ſo well, and are ſo nutritive and ſweet in their effects, as carrots.

For early ſpring feed, I know nothing ſo certain, and ſo little expenſive, (which with us, winter tares, a moſt excellent paſturage, *are not*) as rye-graſs, ſown as clover with oats or barley; the uſual objections to this graſs appear to me to be entirely obviated, by ſowing it extremely thick, not leſs than 1½ buſhel or two buſhels per acre, which renders it proportionably fine; and feeding it as *early* and as *conſtantly* as poſſible.

I laſt year tried, inſtead of the common, the perennial red clover, called cow-graſs, (*trifolium alpeſter*) the feed from it was moſt luxuriant, and the butter excellent; in autumn it was turned in for wheat, of which there is on it (at preſent) the fineſt plant. If this graſs be nearly equal to the common clover in produce, without danger like that to cattle in its effects, far ſuperior in the flavour of its juices, and not an inferior bed for a crop of wheat, it merits general attention.

I have twice after wheat tried a little brank or buck-wheat; though my land is not light enough for it, it is extremely convenient; ſince not being ſown till May at the ſooneſt, the land may leiſurely be fully fallowed, and ſeems ſo little to foul or wear it,* that when off in October, it may be ridged up at once into a winter fallow, for barley in the ſpring.† All poultry, and hogs when running about, thrive upon it, and even ſtalled oxen; and horſes, when mixed half with oats. The ſtraw is tolerable provender for the cow-yard.

Rev. Mr. ONLEY's *Mode of Cultivating his Farm.*

IF a complete year's fallow does not follow the wheat crop, (which is here occaſionally neceſſary even to the neateſt farmer, towards purifying the ſoil, and which by leaſe is never permitted to go beyond a third crop, turnips and clover excepted) my routine is or may be, from the manure I can afford, if I am not out of humour at a little extra trouble, as follows:—

As ſoon as poſſible after the wheat is off, the ſtubble is is mown, and ſtacked for littering the cow-yard in winter, the field ploughed, and half of it ſown with two buſhels of ſmall black winter tares, and one buſhel of rye; the other half is well fallowed, and dunged, as opportunity and the ſeaſon permit, till Midſummer, when either turnips are ſown or cabbages planted on it; and the tares being by that time entirely fed off, are ploughed in, and occaſionally during the ſummer fallowed, and dunged if neceſſary, as the other half was during the ſpring. In the following ſpring, the turnips or cabbages being fed or carted off by March, this field is, at once-ploughing, ſown with oats or barley, and one buſhel of ray-graſs, and half a peck of clover-ſeed, per acre. This large portion of ray-graſs ſeed renders the feed of it much finer, brings it earlier, and, as it ought never to be permitted to run to any luxuriancy, removes every prejudice againſt it.

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* On the contrary, it will clean it more than any thing, excep turnips.

† Or immediately ſown with wheat.

When the corn is off, a ſmall quantity of dung, if it can be afforded, will contribute to bring this excellent paſture ſufficiently forward for cattle—at the lateſt, in the very beginning of May the following year; from which period, it is *continually* depaſtured on till nearly the end of September, when, at once-ploughing, wheat is ſown on the field; and the rotation commences again.

Having thus the four year's cultivation of one field, you have the ſtate of annual crops of the remainder; the great conveniency of which is, to a gentleman—as ſubſervient to his graſs land, which any attentive gentleman can manage as well as the beſt common farmer—that the corn-land produces or buys oats, and wheat-chaff, and ſtraw, for the ſtable; oat-chaff, and ſtraw, for the dry cattle; and ſtubble-ſtraw, for littering down the cow-yard;—turnips or cabbages, as green provender for milch or fattening cattle from December to the end of March;—tares from thence to May; and ray-graſs, till natural paſture is in its full luxuriancy.

To me, who ſeldom keep ſheep, and only take in oxen for *ſummer feed*, this *exact* ſucceſſion of vegetables is not eſſential; to thoſe who do, it is highly ſo; but I always have ſuch a portion of it, as to keep the dairy in full milk.

Where gentlemen will afford the neceſſary attention, the drill and horſe-hoeing huſbandry is, in point of elegance at leaſt, their peculiar province; but as the expence of it is, I conclude, on any conſiderable ſcale very great, and exactneſs peculiarly neceſſary, it is improbable that it ſhould exceed in profit the uſual huſbandry; where, by a rotation of graſs, pulſe, and corn crops, all equally eſſential, and an oppoſite ſpecies always ſucceeding to another, the land is never ſurfeited by ſameneſs; the cultivator ſubject to little diſappointment, ſome portion of his crops making up for the failure of others; and the farmer with his plain inſtruments, gradually drawn into a degree of hoeing culture.

But as produce is too frequently very diſtinct from profit, a ſeries even of ſuch crops will on much land, from the expence of hoeing and manure, not equal a ſhorter circle with intervening fallows. On light lands proper for turnips, little ploughing is neceſſary to pulverize the ſoil, but much manure neceſſary to maintain its vegetation; on a heavy ſoil, little manure is neceſſary for the latter, but much ploughing for the former; yet the barley crop following the fallow on the heavy, will fully equal in value the joint one of the turnips and barley on the light ſoil.——If the land be light, turnips or cabbages will be more profitable than tares and rye, but will require a large portion of dung. For mere conveniency a mixture of theſe crops is moſt eligible.

State of Agriculture in the Isle of Wight.

[By Mr. Rack.]

The nature of its Soil.

THIS Iſland is finely diverſified with gently riſing hills, and fertile well-watered valleys. The hills, being generally cultivated, and abounding with ſprings, are very fruitful; ſome few excepted, which afford good feed for ſheep.

In ſome parts, the ſoil is gravelly, and abounds with flints like that of Hampſhire. In ſome other parts, it is a ſtrong clay; but in the general, it conſiſts of a fine hazel loam, mixed with juſt enough ſand to make it work kindly.

Rents are in general from 18s. to 21s. per acre; ſome meadow lands, near the principal towns, conſiderably higher.

Till within a few years paſt, lime was almoſt the only manure uſed in the iſland, farm-yard dung excepted: but of late chalk as been much ſubſtituted in its ſtead. The farmers find, from experience, that chalk is more operative and laſting. Thirty waggon-loads, of forty buſhels each, are generally laid on an acre, and laſt from ten to fifteen years. It is, however, the general opinion, that a ſecond chalking is of little ſervice.

In thoſe parts contiguous to Newport and Weſt-Cowes, the ſoil is naturally the leaſt fertile; but as great quantities of ſtable-dung are made in thoſe towns, and eagerly bought by the adjacent farmers, the deficiency is pretty well ſupplied, and the produce of their lands nearly equal to that in other parts of the iſland.

Their general inattention to ſea-weed is a proof of their deficiency in the knowledge of manures.

On the eaſt, ſouth, and weſt coaſts, the ſea beats with great violence, and throws up vaſt quantities of weeds on the beach, which might be collected with little expence, and being mixed in compoſt with lime and earth, or dung, prove a moſt valuable and fertilizing manure in thoſe places where it is moſt wanted.

When they break up clover-lays for wheat, they ſeldom plough more than once; but give four ploughings to their fallows. They ſow all broad-caſt, and in general reap from three to four quarters per acre.

The *Turnip* Huſbandry ſeems to be but imperfectly underſtood. In the northern part of the iſle they are not hoed at all. In the eaſtern part, they plough four times, harrow, and hoe once. They feed them all off with ſheep, and value the crop at fifty ſhillings per acre.

Of *Clover* they generally cut two tons per acre, and then let it run to ſeed. Sometimes they ſow tares or vetches, and moſtly cut them green for horſes. In the ſouth-weſt parts, they ſometimes ſow them for feeding ſheep.

On ſome of their moſt ſandy lands, they ſow buck wheat, but the quantity is ſmall.—The paſture-lands, eſpecially in the valleys, are very rich, and produce excellent hay.—Where the lands are wet, they make excellent covered drains, with chalk and heath or ling.

Mode of Farming.

[By a Member of the Society.]

MY aim was to bring all my land as ſoon as poſſible to bear turnips, which I conſider as the foundation of good huſbandry, in the following order:—Turnips, barley, clover, and wheat, and this ſucceſſion invariably. After I got my land in order, for which I ſpared no expence, my crop was large, five quarters of barley, and from eight to ten ſacks of wheat, in general. I made it a rule always to manure my clover as ſoon after the barley was off as I could; and this dreſſing was of the beſt materials I could collect, with ſtable-dung if I could procure it.

No.	Soil.	Acres.	1775.	1776	1777	1778.
1.	Gravelly mould	6	Peaſe	Wheat	Turnips	Barley
2.	Gravel and clay	6	Potatoes Vetches	Wheat	Turnips	Barley
3.	Deep loamy mould	4	Barley	Graſs	Ditto	Ditto
4.	Stiff Soil	5	Wheat	Vetches	Wheat	Turnips
5.	Mellow loam	4	Wheat	Turnips	Barley	Clover
6.	Sandy loam	4	Oats	Turnips	Barley	Clover
7.	Sandy & gravelly ſoil	4	Turnips	Potatoes	Wheat	Turnips
8.	Ditto	6	Turnips	Barley	Graſs	Ditto
9.	Mellow loam.	3	Beans	Vetches	Turnips	Barley
10.	Meadow	10				
11.	Strong clayey ſoil	5	Sum. fal.	Wheat	Beans	Turnips
12.	Stiff clayey gravel	5	Wheat	Turnips	Barley	Graſs
13, 14, 15.	Sandy loam	12	Turnips	Barley	Clover	Wheat
16.	Ditto	4	Wheat	Turnips	Barley	Clover
17.	Sandy & gravelly loam	5	Wheat	Turnips	Barley	Clover
18.	Gravelly ſoil	6	Wh. Oats	Wheat	Turnips	Barley
19.	Sandy & gravelly loam	10	Turnips	Barley	Clover	Wheat
20, 21.	Meadow	16				

By this mode of farming, I had only nine acres of wheat in the year 1777; a conſiderable leſs quantity than any other year. But in general, I wiſhed to have the farm as equally divided as poſſible into the ſeveral crops of turnips, barley, clover, and wheat.

On Setting Wheat.

SEVERAL Letters were very early after the inſtitution of the Society addreſſed to the Secretary, on the great advantages of ſetting Wheat. No doubt was ever entertained that, by this method, a great quantity of ſeed could be ſaved; but whether the expence attending it, and the time employed, were not, on the contrary, objections ſuperior to the advantages was certainly worthy the moſt careful inveſtigation.

We are told in the firſt letter, which is anonymous, that it was firſt begun about the year 1765, on a ſmall ſcale, and that from its ſucceſs it was ſoon followed by others; the ears of the wheat are here ſaid to have been indiſputably larger; the grain of greater bulk, and ſpecifically heavier, than when ſown broadcaſt.—The mode of ſetting it is by a man with two ſetting-irons ſomething larger than ram-rods, and pointed at the end, who walks backwards, and makes holes about four inches aſunder each way, and one inch deep, into each of theſe holes the droppers (women, or children) drop two grains; the land is then buſh-harrowed, and the work finiſhed.—By this mode, it is aſſerted, three pecks of ſeed are ſufficient for an acre; being immediately buried it is equally removed from froſt and vermin; and from its regularity may be kept clean from weeds. Expence of ſetting, 6s per acre.

A ſecond letter, ſigned *Norfolcienſis*, ſays, the practice is pretty general in the Eaſt part of that county, and ſpecifies ſome trials made in which the advantage both as to quantity and quality was greatly in favour of the wheat ſet, over that ſown broadcaſt. And in a ſubſequent letter the ſame correſpondent tells the Society, in anſwer to ſome queries propoſed, that the land on which the experiments were made was light, and within five miles of Norwich; worth fifteen ſhillings an acre, after clover of one year, according to the method above mentioned. He ſays likewiſe, that the ſtraw of the ſet wheat was both ſtronger and higher; that the berry of the corn was more equal, having fewer ſmall grains mixed with it.

A *Gentleman in Suffolk* writes, that on a field ſown and ſet in alternate ſtetches, the produce of the ſet part was eight* buſhels per acre more than the ſown, and 6d. a buſhel *better*.

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* We are told in a note by the Secretary, that he made inquiry whether this enormous difference was not a miſtake, and was aſſured it was matter of fact!

An Anonymous Correſpondent (who is ſtated in a note to be a farmer, a miller, and a baker) ſays, when wheat is ſet, the crop is free from thoſe ſwinged (ſhrivelled) diminutive grains, ſo commonly found in even the beſt crops of that ſown broadcaſt; of courſe it is ſpecifically heavier, and the proportion of flour exceeds the comparative difference of weight. Our farmers know this; and they expect, and we give, a price exceeding that which is commonly given for the reputed beſt wheats that were ſown broadcaſt.

Sir Thomas Beevor ſays: "As I have no wiſh to ſupport any ſyſtem, I would not attempt to recommend any practice which did not appear to me a beneficial one. Wheat-ſetting certainly is ſo, eſpecially when corn is dear; and if the ſeaſon be favourable, may be practiſed with great benefit to the farmer.

"From my own experience, I find the produce is two buſhels per acre more than from the wheat which is ſown; but having much leſs ſmall corn intermixed with it, the ſample is better, and always fetches a higher price, to the amount generally of *two ſhillings* per quarter. Add to this, the great ſupport given to the poor by this *ſecond* harveſt (as I may call it) which enables them to diſcharge their rents, and maintain their families, without having recourſe to the pariſh; and I think the benefit muſt be obvious to every perſon." And in another letter this reſpectable Baronet ſays, "the practice of ſetting wheat does not decline, notwithſtanding the introduction of Mr. Cook's drill-plough."

[By DAVID BARCLAY, eſq.]

Wheat is generally planted on a clover lay, and if the land be very light, it ſhould be ploughed a week or ten days before planted; and ſhould a good rain fall, it would be advantageous, becauſe the holes will ſtand open the better to receive the ſeed, and the ground will not riſe ſo much when buſh-harrowed: In heavier land the plough ſhould precede the dibblers only a day or two, and be planted in the *earlieſt* part of the ſeaſon, which ſhould be particularly obſerved; as heavy land, after much rain, cannot be dibbled.

Plough the ground from three to four inches deep, and nine inches wide, and make about eighteen furrows on one ridge of land, about five yards wide; but when the ſoil is very dry, the ridge may be double the breadth: Let a man follow the plough with a ſpade, and level the flag where it may have been broken by the plough; then roll it with a roller of about ſeven feet, with one or two horſes or oxen, and it is fit for dibbling. A man or a woman has a dibble in each hand about two feet nine inches long, made of iron, the *bottom* of which is made in the form of a *cone*, ſuitable to make a hole in the ground not leſs than two inches deep, and the *handle* is covered with wood for the eaſe of the dibbler, who walks *backward*, and turning the dibbles *partly round*, (which muſt be particularly obſerved, becauſe *that action* prevents the mould from falling into the hole) makes two holes on each flag, at the diſtance of three inches the *length-way* of the flag. Children follow and drop in two or three ſeeds, and care ſhould be taken that they do not drop in more: two at the beginning of the ſeaſon would be ſufficient, and three at the latter end. The land ſhould be buſh-harrowed three or four times in a place, the *ſame day*, by the farmer with buſhes fixed to a gate-lift, or if on light harrows.

care muſt be taken that the tines do not penetrate the ground. Seven pecks of wheat prepared as uſual are ſufficient. One dibbler generally undertakes the buſineſs of one gang, after the ground is ploughed and rolled, at 9s.—9s. 6d.—10s. or 10s. 6d. per acre.

Peaſe and beans are likewiſe dibbled, and one only put into a hole; aud the holes for peaſe are two on a flag, three inches and a half diſtant lengthways; for beans, only one hole in the middle of the flag, and five or ſix inches diſtant. The price of dibbling peaſe 7s. and beans 4s. 6d. per acre.

On Transplanting and Planting Wheat.

Mr. Wagſtaff, of Norfolk, having found ſome large tuſſocks of wheat in the reſervoir of ſome field mice which had ſprouted, tranſplanted them, and had the pleaſure of ſeeing them ſucceed. He ſuggeſts, that a tranſplanted crop in the ſpring, in ground well prepared, would be equal to one ſown in the uſual manner.

Robert Bogle, *eſq*; of Daldowin, near Glaſgow, directs the attention of the Secretary to a paper publiſhed in the Annual Regiſter for 1769, giving an account of an experiment made by Mr. Charles Miller, of Cambridge, when one ſingle grain of wheat produced, in one ſeaſon, 21,109 ears, the corn of which weighed forty ſeven pounds, and meaſured three pecks and a half. Conſidering this Mr. B. ſtrongly recommends the practice; together with harrowing and rolling wheat in the ſpring.

As Mr. Miller's experiment was extraordinary we ſhall here give a ſummary account, as publiſhed in the Philoſophical Tranſactions for 1768:—

On the 2d of June 1766, Mr. C. Miller ſowed ſome grains of the common red wheat; and on the 8th of Auguſt a ſingle plant was taken up and ſeparated into eighteen parts, and each part planted ſeparately; theſe plants having puſhed out ſeveral ſide-ſhoots, by about the middle of September ſome of them were then taken up and divided, and the reſt of them, between that time and the middle of October; this ſecond diviſion produced ſixty-ſeven plants. Theſe plants remained through the winter, and another diviſion of them, made between the middle of March and the 12th of April, produced five hundred plants. They were then divided no further, but permitted to remain. The plants were in general ſtronger than any of the wheat in the fields. Some of them produced upwards of one hundred ears from a ſingle root. Many of the ears meaſured ſeven inches in length, and contained between ſixty and ſeventy grains.

Again *Mr. Bogle* ſtates that he has known many inſtances of very great crops having been obtained by harrowing fields of corn after they were ſprouted; and therefore recommends the practice very warmly.—That he has alſo received an authentic account of one inſtance where the ſame good effects were produced by ploughing the field.—On the ſyſtem of tranſplanting, he ſtates, that a very great proportion of the ſeed will be ſaved, as a farmer may have a nurſery, or ſmall patch of plants, from which his fields may be ſupplied; he calculates that one acre will yield plants ſufficient for one hundred acres.—That a very great increaſe of crops may be obtained by this method, probably a double crop; nay, perhaps a triple quantity of what is reaped either by drilling, or by the broadcaſt huſbandry.—That a great part of the labour may be performed by infirm men, women, and children.—That the expence will not exceed from 20s. to 30s. per acre.—That in general he has found the diſtance of nine nches every way a very proper diſtance for ſetting out the plants at.—That he conceives an earlier crop may be obtained in this manner, than can be obtained by any other mode of cultivation.—That a clean crop may alſo be procured in this way, becauſe if the land be ploughed immediately before the plants are ſet out, the corn will ſpring much quicker from the plants than the weeds will do from their ſeeds, and the corn will thereby bear down the growth of the weeds.—That ſuch lands as are overflowed in the winter and ſpring, and are of courſe unfit for ſowing with wheat in the autumn, may be rendered fit for crops of wheat by planting them in the ſpring, or even in the ſummer.—That he has known inſtances of wheat being tranſplanted in September, October, November, February, March, April, and even as late as the middle of May, which have all anſwered very well.—That he has reaſon to think wheat, oats, and barley, are not annuals, but perennials, provided they are eaten down by cattle and ſheep, or are kept low by the ſcythe or ſickle; and are prevented from ſpindling or coming to the ear.—That one very prevalent motive with him in proſecuting this plan, is, that he is of opinion, it may enable Government to deviſe means of employing the vagrant poor, both old and young, who are now to be met with every where, both in towns and in the country, and who are at preſent a burden on the community.—And *laſtly*, Mr. Bogle has hinted at a ſecondary object which he has in view, from this mode of cultivation, which he apprehends may in time, with a ſmall degree of attention, prove extremely advantageous to agriculture. It is, that the real and intrinſick value of different kinds of grain may be more accurately aſcertained by making a compariſon of it wi[illegible] plants of each kind ſet out at the ſame time, than [illegible] done when ſown in drills or broadcaſt; and when t[illegible] valuable kinds of wheat, oats, or barley, are diſco[illegible] ſtates, that in a very ſhort time (not exceeding four or five years) a ſufficient quantity of that valuable kind may be procured to ſupply the kingdom with ſeed from a ſingle grain of each kind; for he calculates, that 47,000 grains of wheat may be produced by diviſibility in 2 years and 3 months.

[*By Mr.* ISAAC ROGERSON, *of Briſtol.*]

When a few grains have been planted in a garden, or even in a field, at 6 or 9 inches diſtance, the produce has often been twice or four times as much as what is reaped in common per acre in proportion. And yet no one, that I ever read or heard of, has undertaken to give any other reaſon for this great difference, than that of the plants ſtanding at ſuch diſtance from each other, and being kept clear of weeds.—— On the 30th of Auguſt 1782, I marked out a ſquare yard of ground, with four rows, nine inches apart; I put thirty grains of wheat in each row two inches deep, this I call No. I. Nov. 12, I took four plants out of each row, and tranſplanted to No. II. alſo a yard ſquare.

No. I.			No. II.	
....	26	10	45	6
....	3	2	14	21
....	19	20	2	29
....	32	41	23	17

I kept both clear of weeds, and hoed one end of the rows, but I could not perceive any difference between that which was hoed, and that which was not hoed: I have diſcovered the cauſe. The number of ſtems of No. II. was as marked above.—The produce of No. I. was four hundred and ſeven ears, 1lb. 5 oz. of corn; ſeven hundred and fifty grains weighed an ounce. The produce of No. II. was three hundred and thirty-three ears, 1 lb. 2 oz. 8 dwts. of corn; ſix hundred and eighty grains weighed an ounce. The value of the crop per acre of No. I. at 60 lb per buſhel, and nine ſhillings per buſhel, is 26l. 9s. 4d.—Now the great and important queſtion is, what is the principal cauſe of ſo great a produce? There was no great expence, and I am certain it was not the goodneſs of the land. It appears plainly, that there muſt be ſome particular cauſe, or cauſes, of this great produce; and likewiſe a cauſe, or cauſes, why good land produces ſo much leſs in common.

[*By* R. M.]

As a proof of the ſurpriſing advantages that attend the planting or ſowing wheat in drills, and the immenſe ſaving of ſeed by that method, I beg leave to mention the following inſtance, which fell within my own obſervation:—Some years ſince, Mr. Wheatly, of Morden, in the county of Cambridge, planted an acre of land with wheat, leaving a foot ſpace between every two kernels: The whole acre took up half a peck and one pint of ſeed, and the produce was 39 buſhels.

On DRILLING.

[*By Sir* JOHN ANSTRUTHER, *bart.*]

Some years ago I had a plough made of the ſame kind with the model and drawing which I have the honour of preſenting to your Society.

Not having ground ſo proper as I wiſhed, I drilled the ſide of a field, the ſoil of which was light and ſandy, and in ſuch bad order, that the preceding crop was a very indifferent one. It was therefore manured with a compoſt dung-hill.

After croſs-ploughing and manuring, it was laid into four and a half feet ridges, then harrowed and drilled with one peck and a half of wheat on an acre and a quarter, which is nearly one peck and a fifth per Engliſh acre. It was drilled the 27th of October, and rolled after drilling. The crop was late in its appearance, and very backward in the ſpring. March the 31ſt, it was horſe-hoed one furrow *from* the rows.—April 8th, it was hand-hoed and weeded *in* the rows.—25th, horſe-hoed again, laying a furrow back *to* the rows.—May 15th, hand-hoed the ſecond time.—June 2d, horſe-hoed *from* the rows.—June 12th, hand-hoed the 3d time.—July 14th, horſe-hoed *to* the rows.

The crop, when reaped and threſhed, yielded me thirty-ſix buſhels on one acre and a quarter, which is twenty-eight buſhels and three pecks per acre; and the produce from one peck and a half ninety-ſix for one.

Mr. Randal ſays, "It is an experimental fact, that on a fine loam, exquiſitely prepared, one hundred and forty-four buſhels have been produced from one acre."

Horſe-hoeing is certainly preferable to cloſe drilling, or hand-hoeing; but the latter is ſuperior to broadcaſt.

Mr. Tull directs four hoeings, and Mr. Forbes five:—1ſt. In November when the plant has four blades.—2dly. In March, deep, and nearer the rows than the former. Both theſe hoeings ſhould be *from* the rows.—3dly. Hand-hoed when it begins to ſpindle, if the earth be crumbly, *to* the rows.—4thly. When it begins to bloſſom, *from* the rows, but as near to them as in the ſecond hoeing.—5thly. When done bloſſoming, to ripen and fill the grain, *to* the rows.

You will remark, that this double drill-plough ſows two ridges at a time; the horſe going in the forrow between them, and of courſe does not tread upon the ground intended to be ſown; which with a ſingle drill muſt be the caſe, and does much harm by the horſes' feet ſinking and making holes in the fine ground, which retain the water, and hurt the wheat when young.——1782.

In order to discover what produce would arise from rich land in a garden, from different quantities of seed, several rows were planted, each row was twenty feet long, and there were two feet distance between the rows. The following was the produce:—

Crop, 1783.—Table I.

Experiment	Grains per hole	Holes. Distance	per Foot	Grains per Foot	Ears. per hole	after 1 Grain	per Foot	Grains. per Ear	after 1 Grain	per Foot	per Square Foot
I.	2	3	4	8	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
II.	[illegible]	12	1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

In 1784, the following rows were examined; the rows were 20 feet long, and 3 feet distant from each other.

Table II.

Experiment	Grains per Hole	Holes. Inches dist.	per Foot	Grs. sown per Ft.	Ears. per Hole	after 1 Grain	per Foot	Grains. per Ear	after 1 Grain	per Foot	per Square Ft.
I.	2	3	4	8	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
II.	2	12	1	2	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
III.	7	3	4	28	25	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
IV.	1	12	1	1	[illegible]	[illegible]	[illegible]	42	[illegible]	[illegible]	[illegible]
V.	3	12	1	3	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
VI.	3	12	1	3	[illegible]	19	[illegible]	41	[illegible]	[illegible]	[illegible]
				Average	[illegible]	21	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

In 1784, twelve rows were planted, two of each with the following number of grains, the rows three feet distant, and twenty-eight feet long. In 1785, the average produce of every two rows was as follows:—

TABLE III.

EXPERIMENT	Grains per Hole	HOLES.		No. of grs. per ft.	EARS.			GRAINS.			per Square Foot
		Diſt. per Hole	No. per Foot		per Hole	after 1 Grain	per Foot	per Ear	after 1 Grain	per Foot	
I.	2	3	4	8	10	5	40	51	255	2040	680
II.	2	12	1	2	31	15½	31	51	790	1581	527
III.	7	3	4	28	18½	2¼	74	51	134	3774	1258
IV.	7	12	1	7	42½	6	42½	44	264	1848	616
V.	1	3	4	4	18	4½	72	56	1008	4032	1344
VI.	1	12	1	1	29½	29½	29½	56	1652	1652	550
				Average	25	12¼	48	51	683	2488	829

EXPLANATION of the TABLES. [See 2d Table as above.]

The 1ſt column denotes the number of the experiments	1
2d, the number of grains per hole	2
3d, the number of inches diſtance between the holes	3
4th, the number of holes per foot.	4
5th, the number of grains ſet per foot	8
6th, the number of ears per hole	16½
7th, the number of ears from each grain	8½
8th, the number of ears per foot	66
9th, the number of grains per ear	38
10th, the number of grains from each grain	312
11th, the number of grains per foot	2508
12th, the number of grains per ſquare foot	836

The average of every two rows is ſtated in the above table. The greateſt increaſe after one is from one grain per hole, and one hole per foot of the rows, and the rows at 3 feet diſtance.——Laſt year, one grain per foot in the rows produced 52 ears per hole, with 42 grains per ear; that is, 2184 grains after one; and as every grain has three feet of ſpace, or 432 inches, this increaſe is 728 grains per ſquare foot.—This year, one grain at the ſame diſtance produced 29½ per hole or foot of rows, with 56 grains per ear, which is an increaſe of 1652 after one, and 550½ per ſquare foot. —The quantity of ſeed planted is at the rate of one-twelfth of a peck per acre.

The greateſt produce upon the foot ſquare is from ſeven grains per hole, and four holes per foot in rows, or 28 grains per foot, although this is the ſmalleſt increaſe after one. Laſt year the produce of grain planted at theſe diſtances was 25 ears per hole, or 100 per foot of rows; the ears had 39 grains each; which is only 139 grains after one, but is 1300 per ſquare foot.—This year, that which was planted at 28 grains per foot, yielded 18½ ears per hole, and 74 per foot, with 51 grains per ear, which is only 134 after one, and 1258 per ſquare foot. The 28 grains per foot of rows, or three ſquare feet, has 15½ inches of ſpace per grain: and the ſeed is at the rate of two pecks and a half per acre. —The produce of laſt year, viz. 1300 grains per ſquare foot is at the rate of eighty-four buſhels and three pecks per acre. And the produce of this year, viz. 1258 grains per ſquare foot, is at the rate of 81 buſhels and two pecks per acre.*

This year one grain per hole, and four holes per ſquare foot, yielded more than the 28 grains did, as it produced 1008 after one, and 1344 per ſquare foot. All the rows with more grains per foot than one yielded more in general than one grain. But one row with the ſame number of holes per foot, with two grains per hole, yielded only 235 grains after one, and 680 grains per ſquare foot.

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* Theſe variations of the produce of the experiments ſhew how little a few ſmall experiments can be depended upon to eſtabliſh any ſyſtem. The greateſt produce in both theſe years is from 28 grains per foot of rows; they are more per ſquare foot than the others with ſmaller quantities of ſeed. But one row with four holes per foot, and only one grain per hole, produced more than thoſe. This experiment ſhews the great produce from one grain where it has ſpace, and the great crops that rich ground may produce.

The average of the twelve rows per ſquare foot is 829 grains; and by the above calculation, the produce is at the rate of 53 buſhels and three pecks per acre of good grain. But upon weighing one ounce of this, there were 760 grains per ounce, which is one-twelfth more than is ſuppoſed in the above calculation, which would therefore make the produce of this and the others one-twelfth leſs.

As laſt year the greateſt quantity of ſeed ſown, viz. two pecks and a half, produced the greateſt produce per acre, although the ſmalleſt increaſe after one; the increaſe after one was diminiſhed from 2184 to 139. We ſee in the field that the increaſe is much diminiſhed by great quantities; as where three buſhels are ſown, if each yielded 20 after one, the produce would be 60 buſhels, whereas it is ſeldom above 20 or 30, which is only from ſeven to ten after one.

To diſcover if this decreaſe continued in proportion to greater quantities of ſeed, ſome barley was planted in ſpring 1785, both in a garden and field. In the garden ſome rows were planted at one foot in the rows, and the rows were three feet diſtant; ſome with one and two grains per hole, and ſome with 14 and 15 per hole, and others with more holes per foot. In the field,* they were planted at nine inches every way, the firſt row with one grain per hole, and increaſing the grains one every row to fourteen and fifteen; this is near three times the greateſt quantity of ſeed of the wheat planted in the garden.

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* The ridge dibbled with barley was ninety-three yards and two feet long, and five yards broad, which is 468 ſquare yards. The Engliſh acre is 4840 ſquare yards, therefore this ridge is the tenth and one-third of an acre; the produce of it, when threſhed, was three firlots and two pecks and three quarters of barley meaſure; this is one half more than the wheat meaſure. Therefore this ridge produced five buſhels two gallons and three quarters of wheat meaſure, or Wincheſter meaſure. By this proportion, the produce would be fifty-five buſhels one gallon and three quarters per Engliſh acre.——N. B. The wheat meaſure is about one per cent. more than Wincheſter.

On viewing the crops in May, the planted wheat, where moſt grains were dropped, looked very well, and proved good plants; but thoſe rows with few grains, and at one foot diſtance, were very bad, and had few ſtems. The barley in the garden, where there were few grains, and at one foot in rows, and at three feet diſtance, appeared extremely bad; thoſe with moſt grains, and the holes neareſt, were much the beſt. That in the field with one grain, and with few grains per hole, was very bad.

Upon examining them afterwards, when the wheat with moſt grains was about 3 feet high, the wheat with one and two grains was ſo bad, that it did not appear probable it would produce any thing like a crop. The barley was the ſame.

That in the field with one grain, and with few grains per hole, was bad; and as there were twelve rows, they increaſed in colour and length, as the number of grains. The firſt with one grain the worſt; and thoſe with 14 and 15 grains by much the beſt. But afterwards, thoſe with few grains improved ſurpriſingly, and were very good.

When in the ear, the wheat in the garden with few grain had ſeveral blanks in the rows where there were no plants, and when the ears were numbered, gave the quantity marked in the table of the barley in the garden; only thoſe three rows which were at one foot in the rows could be reckoned, the others being ſo lodged, they could not be numbered with any accuracy. Of theſe three, the produce from each hole could not be reckoned, but in each row there were tw[illegible] eight holes at one foot; thoſe with one and two grai[illegible] 280 ears, which is ten per hole; but as the holes co[illegible] be counted, it appeared there were ſeveral holes th[illegible] no ears, the ſeed having periſhed. Thoſe with 14 and 15 gave 425, which is 15 ears per hole; but the holes that had no ears could not be known. Of the barley in the field, the average of each row was taken at four different places.

Thoſe with one and two grains, which appeared ſo bad in ſpring, and during part of the ſummer, yielded at the rate of 20 ears per hole; and up to 8, they yielded at an average 20 ears per hole; and from 8 to 15 grains, they gave on an average at the rate of 24 ears per hole. There was only one row with 15 grains gave more.

On ſome land well prepared there was one ridge of wheat tranſplanted from a field, but the froſt continued ſo long in the ſpring, that the wheat plants could not be got to tranſplant early, being ſo weak; and the ſpring being ſo dry, thoſe planted in the beginning of April all died, although watered at planting; the moſt of what grew were planted the 19th and 20th of that month. They are planted at nine inches in the row, and the rows at nine inches; this makes eighty-one ſquare inches per plant; which would be 77,440 plants per acre. The expence was nearly 2l. 5s. for taking up the plants, and planting them; but as it was a new thing, it was not ſo quickly done: if the people were accuſtomed to do it, I ſuppoſe it might be done for half the expence. The manner of doing it was as follows:—A man with a dibble, having five points of three inches long, walked backwards, and put them in with his foot in the manner a man digs with a ſpade; the dibble had a ſtrong head, and a handle like a ſpade, into which theſe five points were fixed. A boy brought a baſket full of plants from the man who dug them up, and having ſeparated the ſets, dipped the baſket in a tub of water; a boy or woman put down a plant at every hole, and a man followed, planted them in the hole, and put the earth about them with a common dibble as a gardener does;

they omitted to number the grains in the ear. The number of ears per plant were reckoned at four different places of the ridge, and the average was ſixteen ears per plant; but there were a great many of the plants dead, and many blanks in the rows. As this is eighty-one inches of ſpace to the plant, this is at the rate of twenty-eight ears per ſquare foot. If the ears had only thirty grains, this would by the former calculation be a great crop, and equal to the average in the garden this year. The grain was ſmall, and one ounce contained 810 grains. The ſmallneſs of the grains might, probably, be occaſioned by the late planting and the dryneſs of the ſeaſon that followed.——This year the ſame experiment is again tried, with plants from ſeed ſown in the garden in Auguſt laſt, and ſome from ſeed ſown laſt year in October, and frequently cut over during ſummer.—*Jan.* 1786.

The Drills were eighteen inches wide, and the grain was dropt by hand, the expence of which was 3s. 3d. per acre. The ſeed drilled was one buſhel and three gallons per acre. The produce was fifty-ſix buſhels and three gallons per acre.

On the broadcaſt part, the ſeed ſown was three buſhels and five gallons per acre. The produce only thirty-ſix buſhels and five gallons per acre.—*Feb.* 1786.

In the year 1785, 3 A. 2 R. 20 P. of Engliſh meaſure were drilled with ſome Lincolnſhire barley. Part of this was one acre, upon which the experiment of tranſplanted wheat, and dibbled wheat and barley, was made laſt year. The remainder was after carrots and cabbages, and as it was not manured for theſe, it had a top-dreſſing of dung. Upon that were drilled 4½ buſhels of Wincheſter meaſure; theſe were drilled after the plough, by a man following the plough, and dropping the ſeed by hand; a ſecond plough followed and covered this; and the third furrow was ſown and covered in the ſame manner: by this plan the rows were at eighteen inches diſtance; theſe were hand-hoed once at the expence of 10s. The produce was 147 buſhels, which is nearly 32 for one, and is 40½ buſhels per Engliſh acre.

The reſt of the field was ſown broadcaſt at the ſame time, with the ſame grain; the ſame quantity of this was meaſured, viz. 3 A. 2 R. 20 P. and the proportion of ſeed to this meaſure was 16½ buſhels, or about 4½ per acre. This was after turnips, for which the land was previouſly manured. The produce was 114 buſhels, which is nearly 7 after one, and 31¼ buſhels per Engliſh acre.

Produce of the drilled per acre - -	40	BUSHELS.	Broadcaſt produce	31½	BUSHELS.
Deduct the ſeed	1¼		Deduct the ſeed -	4¼	
Clear produce	39¼		Clear produce	27¼	

Produce of the drilled ſuperior 12¼ buſhels.

EXPERIMENTS 1786.

Half an acre was drilled with wheat, and horſe-hoed. This was once ploughed after a crop of barley, drilled at 18 inches. It was deſigned to have been ploughed in ridges 4 feet 8½ inches, which ſhould have made 21 ridges, as the breadth was 33 yards; but by the ploughman's want of experience in ploughing ſtraight ridges, they were unequally broad, and there were only 17 ridges.

It was drilled the 21ſt of October 1785, with two rows of wheat upon each ridge, with partitions of 14 inches; two intervals three feet four inches. It was ſowed with a peck and a half; was four times horſe-hoed, twice from, and twice to, the rows; and three times hand-hoed in the partitions and rows.—October 21ſt, upon a ridge 74 yards long, and four broad, which is the 16th part of an acre, were tranſplanted ten rows of wheat plants, at nine inches diſtance every way, from ſeed ſown in a garden the end of Auguſt, and two rows from ſeed ſown in May.—Nov. 12th, another ridge of the ſame dimenſions was planted with plants (from ſeed ſown in Auguſt) at the ſame diſtance. At the ſame time one ridge was dibbled of the ſame dimenſions with wheat, at nine inches, and the wheat dropped in the holes, and from one grain to 15 per hole, and two rows of each.—March 31ſt, two ridges of the ſame dimenſions (viz. the 8th of an acre) were planted with plants, at the ſame diſtance, from ſeed ſown in Auguſt.

The drilled half acre produced five buſhels and two pecks; which is at the rate of 11 buſhels per acre:—had there been 21 ridges, it would have been in proportion 13 upon 21 ridges. The numerous gaps or blanks, and ears broke down and loſt by the wind, made this a bad crop.

	B.	P.
The produce of the two ridges tranſplanted in October and November, being the eighth of an acre - - - - - - - - - - - - - -	2	2
That of the two tranſplanted the 31ſt of March -	1	0
The one ridge dibbled with wheat in different quantities, being the 16th of an acre - - -	1	0
At this rate the proportions would be per acre,		
That tranſplanted before winter - - - - - -	20	0
That planted with grain - - - - - - - - -	16	0
That tranſplanted the 31ſt of March - - - -	8	0

In the year 1787, the reſult was—

ABSTRACT.

	Produce. B.	P.	G.	Part of an acre.	Buſhels per acre.
Two ridges, 8th of an acre, tranſplanted November 1ſt - - - - - - - - - -	3	2	1	1-8th	29
One ditto, dibbled with grain Nov. 2d,	1	2	1	1-16th	26
One ditto, drilled by hand (ſeed ½ gallon)	1	3	0	1-16th	28
One ditto, tranſplanted March 12th - -	1	2	0	1-16th	24

[*By a Gentleman Farmer in Hertfordſhire.*]

If large farmers would be at the trouble of calculating the value of what they unneceſſarily ſow on 2 or 300 acres of arable land, the amount would aſtoniſh them.

One of the great advantages of the Drill-Huſbandry is the ſaving of ſeed: but from a variety of cauſes, ſome real ones in local ſituations, and many imaginary ones, it is not probable it will, in our time, be univerſally adopted.

A very rich fertile ſoil, in good tilth, requires leſs ſeed by one-third than a poor hungry one. Hence it follows, that a double quantity of ſeed is wanted on poor land;—and therefore, that on ſuch land the broadcaſt mode of ſowing is preferable to Drilling.

It appears clearly evident to me, that on ſuch land two buſhels, or even ten pecks of wheat, and three buſhels of barley, and four of oats, may be neceſſary. But on a rich fertile ſoil, well prepared, half the quantity is fully ſufficient, and will produce a better crop.

With reſpect to ſowing wheat, the quantity of ſeed ſhould be proportioned to the ſeaſon. If you ſow in September, *a third leſs* will do than when ſown in November or December, becauſe more of the ſeed miſcarries in that unfavourable ſeaſon.

[*By Mr.* J. EXTER, *of Pilton, Devon.*]

In the year 1790 I made my firſt trial of Drill Huſbandry, by ſowing a ſmall part of a field with Winter's Drill Machine, with barley at ſix inches, the intervals of which were hand-hoed, which excited my curioſity to make further compariſons between drilling and broadcaſt ſowing.—In order the better to anſwer my purpoſe; I made a journey in the ſummer of 1791, to ſee different crops then growing which had been ſown with drill machines, and to collect what intelligence I could on the ſubject; the reſult of which was my determining in favour of Mr. Cook's machine, and his ſyſtem of management.

The plough arriving too late in the ſeaſon, I could only make a trial of a field of two acres and a half, and out of condition; part of it was drilled at the rate of one buſhel of red Lammas wheat to an acre, in rows, with nine-inch intervals. The other part was ſown broad-caſt. The drilled crop was ſcarified once in March, and horſe-hoed in the laſt week of May; after this laſt operation it improved greatly, and began to ſhew a decided ſuperiority over the broad-caſt, which evidently continued to decline. At harveſt the drilled part yielded 19 buſhels 3 pecks, nine-gallon meaſure, per acre; the part broad-caſt not quite 5 buſhels per acre.

In March 1792, I drilled one buſhel of white Lammas wheat on one acre of potatoe-fallow, worth 20s. per acre, prepared by once ploughing and harrowing. The plants, when double-leaved, had one ſcarifying, and immediately after were harrowed acroſs with the common harrow, and when ſix or eight inches high, were horſe-hoed; the crop appeared very thin till after Midſummer, yet I had a very great produce at harveſt, both of grain and ſtraw; the acre yielded 29 buſhels 3 pecks of wheat, nine-gallon meaſure.

The ſame ſpring I tilled 30 acres of land, worth from 35s. to 40s. per acre, with barley; fifteen acres drilled at two buſhels per acre, with rows at nine inches; and fifteen acres broad-caſt, from three to four buſhels per acre; the preparation of the land, manuring, &c. in every reſpect alike. The ſeaſon proved very wet, both during the growth of the crop, and at harveſt:—The part broad-caſt was lodged, ſtained, and with great difficulty harveſted at all. The drilled corn ſtood better, ſcarcely any of it was lodged, and being free from graſs and weeds, was all ſaved without the leaſt injury, at half the extra expence of the broad-caſt.

the produce of grain from ten to fifteen buſhels per acre more, and a ſhilling per buſhel better.——In October following I tilled a field of ten acres with wheat; the management of this field, with reſpect to tilling, manuring, &c. in every reſpect ſimilar, except that one half was drilled with half the quantity of ſeed at nine-inch intervals, and that the other half was ſown broad-caſt. At harveſt two ridges were cut firſt, and immediately after a breadth of the broad-caſt on each ſide of the ridges was cut, and each part ſtacked and kept ſeparate till it was dry enough to threſh, when it was carted into two different barns, and immediately threſhed and winnowed; the drilled crop yielded 29 buſhels 3 pecks, the broad-caſt 20 buſhels 1 peck.

Advantages of Drill-Huſbandry.

1ſt. Saving of half the ſeed-corn uſually ſown.

2d. A more regular and certain growth of that ſeed, from its being depoſited at ſuch depth in the ſoil that it immediately vegetates, and grows on more regularly together, and ripens at the ſame time; a matter of great importance in a dry ſpring ſowing.

3d. Aſſiſting the growth of the crop by pulverizing and breaking the ſoil, and deſtroying the infant weeds during the growth of the crop on it, by ſcarifying and horſe-hoeing.

4th. Producing a larger and better crop; which is

5th. Harveſted at a leſs expence, and with a greater certainty, as it never abounds with graſs, weeds, &c. as broad-caſt corn often does, and is never injured by the luxuriant growth of artificial graſſes in wet ſummers.

6th. The ſcarifying and horſe-hoeing leaves the ſoil in a much more friable ſtate, and cauſes it to work much freer, and prove more productive for the future crops.

Diſadvantages of Drill Huſbandry.

1ſt. The difficulty of finding a perſon acquainted with the uſe of the machine.

2d. The ſoil muſt be very well prepared to admit of it.

[Not at all finer than for good management in the broad-caſt.]

3d. The crop is too thin ſown, and land loſt in the intervals.

[This objection has ſome force on certain ſoils, if the ſcarificator and hoe be not uſed, but is entirely done away if it be well managed.]

4th. Harveſting later than broad-caſt crops.

[This might be brought in argument againſt a dung-hill, tho' few modern farmers will reject its uſe on that account.]

5th. Clover not ſucceeding with it.

[My crops of clover ſpeak powerfully in favour of it: I have never had better in the common way.]

6th. Oats, producing ſtraw rank and coarſe, and not good food for cattle.

[If oxen be admitted as evidence, they will prove the contrary.]

With reſpect to the ſcarifying and hoeing, much remains at preſent to be learnt. I gueſs theſe operations have been too often neglected altogether, to the very great injury of the ſyſtem; many gentlemen who have drilled, have looked no farther into the buſineſs. I have myſelf ſeen inſtances of this innattention, and am convinced how ſeverely the ſyſtem has been injured by it. I have this ſeaſon ſeveral crops of turnips, partly drilled and partly broad-caſt in the ſame field; the advantage of drilling is too apparent to admit a doubt on it, and there is a ſaving of at leaſt 4s. per acre in the hoeing of a crop drilled at 12 inches apart, beſides the opportunity of doing the work more compleatly. Beans drilled in two rows at 9 inches, with an interval of 27, if well weeded early, and ploughed between, as directed by Mr. Cooke, [illegible] quite a thicket.

[*By Mr.* WIMPEY, *North-Bockhampton.*]

You will probably be much ſurpriſed to hear, after ſo many years practice, I ſhould not yet be able to make up my mind reſpecting the beſt, that is, the moſt beneficial, mode of practiſing the Drill Huſbandry. I am at this moment at a loſs, whether it is beſt to drill wheat in ſingle, or in 2, 3, or 4 rows. I have tried them all, but what I have generally practiſed is drilling on three-bout ridges, 3 rows, 11 or 12 inches aſunder. Three bouts form a ridge about 4½ feet broad; three rows, at the diſtance above, occupy 2 feet, and the horſe-hoe running along the ſide of each outſide row, at about 3 inches diſtance from the ſame, leaves the ridge 2½ feet broad, and the intervals between the ridges about 2 feet. This has been my uſual method, which has commonly ſucceeded well; but as I have conſtantly obſerved that the outſide rows are by far the ſtrongeſt and moſt vigorous plants, I am much inclined to believe that two rows only on two-bout ridges would be as productive, and leave the ground, in better condition.

[*By* G. WINTER, *Esq; Charleton.*]

A field of about ſeven acres drilled with horſe-beans, was ſo barren, that I could not let it, in the year 1783, for ten ſhillings an acre; the ſoil about four inches deep, on a very ſtiff clay, was about nine years paſt greatly impoveriſhed by burning, and improper cultivation. By my mode of management, it produced me laſt year upwards of 180 buſhels of excellent cone wheat, nine-gallon meaſure.* Time did not permit my ploughing up the ground before the beginning of December laſt; and it was then done careleſsly, in irregular ridges from four feet and a half to ſix feet wide, as I intended it to have been again ploughed twice more in the ſpring. The ſevere froſt fruſtrated my intentions; this field could not be cultivated before April. The ſurface was well pulverized by the froſt, and on ploughing a ſingle ridge, I found the under-ſtratum of too hard and conſolidated a texture to afford me the leaſt expectation of ſucceſs by further ploughings. As the ſeaſon was ſo far advanced, I ventured in that condition (rather than loſe the opportunity of a crop) to drill in horſe-beans, two buſhels to an acre, in the beſt manner I could, in rows 27 inches diſtant, 3 inches deep, and 3 inches apart in the rows, with irregular intervals between thoſe different ſized ridges; which drilling was performed in eight hours, on the 20th of April laſt. This was the firſt operation of my new machine, the cylinders whereof being *then* made of wood, were injured by the hardneſs of the beans, conſequently, by its continual friction, did not deliver the beans, at the laſt working, ſo regularly as I could have wiſhed; nevertheleſs, my beans appeared, in a very ſhort time, ſuperior to any planted by hand in the neighbouring fields.

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* About 28 buſhels and a half per acre, Wincheſter meaſure.

On the 26th and 27th of May the whole field was hoed, with an inſtrument containing three triangular flat ſhares fixed in a plank, with a ſhort beam and wheel to render the working ſteady and govern the depth, being about two inches; which cut the weeds, the three ſhares clearing the breadth of near two feet, being guided by handles the ſame as a plough. The ſecond hoeing was performed as before, on the 26th and 27th of June. It was after this worked with a ſmall horſe-drag rake, three feet long and 18 inches broad, with handles to guide it. The third hoeing was executed with a Norfolk plough, turning the looſened mould to the beans. I found my ground-work well during the exceſſive dry ſeaſon, and on examining other grounds managed in the common way, found my crop far ſuperior.

[*Rev. Mr.* CLOSE.]

The following experiments were made in two fields now parted by a ditch, but formerly in one piece, containing in the whole eleven acres; at this time they are in a ſix and five-acre cloſe.—The ſix-acre field, after yielding two large crops of clover, was ploughed October the 18th, 1782, and on that and the following days planted with wheat on the firſt earth, allowing one buſhel of ſeed to each acre. In May following, the crop was properly cleaned by hand-hoeing. On the 12th of Auguſt twelve reapers cut it. After ſtanding a proper time in the field, it was brought home: and upon threſhing it, the ſix acres produced only 84 buſhels.——Oct. 16th, 17th, 1782, the adjoining five-acre field was *ſet* in ridges, planting two feet, and leaving two-feet intervals, with two pecks of ſeed-wheat per acre; ten pecks the whole field. It was hand-hoed and cleanſed in the ſame method as the other crop, except that the intervals were *horſe-hoed.* It was reaped one day ſooner, ſtood in the field the ſame time, and was threſhed by the ſame labourers. The crop produced 128½ buſhels. This wheat ſucceeded a crop of potatoes, not manured for, but twice horſe-hoed. The tines of the frames made uſe of in planting were 3 inches and a half apart. There is at this time a very promiſing proſpect of a good crop on the laſt year's intervals.

Expences of the Six-Acre Field --- ---		£21	0	0
Received for 84 buſhels, at 6s. per buſhel ---		25	4	0
Nett profit from the ſix acres only, beſides ſtraw worth two guineas --- --- ---		4	4	0
Expences attending the Five-Acres	£.15 17 7½			
Produce 16 quarters, ſold at 48s. per qr. ---		38	11	0
Value of ſtraw --- --- --- ---		2	9	0
		£.41	0	0
Expences as above --- --- ---		15	17	7½
Nett profit ---		£25	2	4½

The ſame Rev. Gentleman, in another letter dated 12th of October 1789, ſays "the ſuperiority in favour of the drill and horſe-hoeing ſyſtem (as recommended by Mr. Cooke) above the common broadcaſt amounts as near as poſſible, on the average, to one year's rent and a half. I ſhall not trouble you with each particular experiment, but aſſure you they were accurate, and tried on lands from the yearly rent of 3s. to 30s. per acre. Two hundred pounds is the annual ſaving in my ſingle occupation in the article of ſeed-corn only."

[*By Mr.* Wimpey.]

The facts aſſerted by the Rev. Mr. Close are of the moſt important nature; and a particular deſcription of the ſeveral proceſſes would have been an invaluable treaſure to the practical farmer. I have the higheſt opinion of Mr. C.'s ſkill, ingenuity, and veracity; but he is a very extenſive cultivator indeed, if he ſaves more than 200l. per annum in the article of ſeed only, by ſowing with Cook's machine inſtead of the common method, as I calculate, 800 to 1200 acres of wheat yearly. I am much afraid ſome error has here crept in; perhaps it is in my conception of this matter. He has decided clearly and ſtrongly in favour of the drill mode; but, taking the whole of his paper into conſideration, it ſhould ſeem the advantage ariſes more from the ſavings in the feed than in an increaſe of the produce—ſo that the merit is imputable to the machine rather than the drilling. The ſowing the ſeed regularly, as to diſtance and depth, is undoubtedly advantageous; but let the ground be as well prepared for promiſcuous ſowing by hand as it *muſt* be for the ma[illegible]
will be found that three buſhels of barley, [illegible]
acre in the old method, will be ſuperior to two [illegible]
with the machine, by three or four times the [illegible]

the ſeed. Of the truth of this I have had the cleareſt and moſt ſatisfactory ocular demonſtration.

The true principle of the drill method is very far from being *generally* well underſtood, even by drill-machine makers. They have dropped and loſt the principle on which the ſuperior ſucceſs of that mode is ſuppoſed, or rather *known*, to depend; for cloſe drilling, or any drilling that does not allow intervals for thoroughly pulverizing the ſoil, and preparing it for future crops, has little advantage over the common method. I am afraid agriculture will acquire little improvement from experimentors, till they can be prevailed upon to act upon more liberal principles; but while the paltry conſideration of a premium preponderates againſt publick good, no ſucceſs can be reaſonably expected; the motive is too ſelfiſh for it to ſurvive the reward that gave it birth; and they commonly expire together. I had begun a firſt attempt to explain and enforce the drill huſbandry, but my indiſpoſition became ſo great, that I was forced to abandon it; whether I ſhall be able to reſume it, GOD only knows.

[The latter part of this letter contained an affecting account of the author's growing infirmities, which ſoon after put a period to his exiſtence, in the 83d year of his age.]

[*Rev. Mr.* CLOSE.]

I am ſorry your late correſpondent Mr. Wimpey, ſhould have departed this life before he had made a greater progreſs in his agricultural purſuits. He calculated, that I muſt have ſown 8 or 1200 acres of wheat yearly, to ſave 200l. in ſeed-corn, and therefore concluded, my aſſertion muſt have been erroneous.——The facts in detail, which I ſhall now trouble you with, will demonſtrate that I ſhall ſave this year, on only 131 acres of arable land, 100l. 4s. 6d. in the article of ſeed-corn; and then, I think, it may be fairly inferred, that

I could not exceed the bounds of truth, when I aſſerted that I ſaved above 200l. a year in ſeed-corn, when I had more than 500 acres of arable land in my hands; though, at that time, drilling and horſe-hoeing were not ſo well underſtood as at preſent.

Expence of Seed-Corn upon 131 *Acres of Land, sown in the usual Broad-Cast Husbandry.*

Acres		£.	s.	d.
31	of Wheat, 3 buſhels per acre, at 7s. per buſhel	32	11	0
26	Early Peas, 4 bls. per acre, at 8s. per bl. - -	41	12	0
18	Dun Peas, 4 bls. per acre, at 5s. 3d. per bl.	18	18	0
15	Tick Beans, 3 bls. of ſeed per acre, at 5s. per bl.	11	5	0
6	Early Maz. Beans, 3 bls. per acre, at 6s. per bl.	5	8	0
12	Oats, 4 bls. per acre, at 3s. per bl. - - -	7	4	0
13	Barley, 3 bls. per acre, at 3s. 6d. per bl. -	6	16	6
12	Vetches, 3 bls. per acre, at 6s. per bl. - -	10	16	0
	Total	£.134	10	6

Expence for Seed-Corn upon 131 *Acres of Arable Land, in the present improved Drill-Husbandry.*

Acres.		£.	s.	d.
31	of Wheat, 3 pecks of ſeed per acre, at 8s. per bl.	8	2	9
26	Early White Peas, 3 pecks per acre, at 8s. per bl.	7	16	0
18	Dun Peas, 1 buſhel per acre, at 5s. 3d. per bl.	4	14	6
15	Tick Beans, 3 pecks per acre, at 5s. per bl. -	2	16	3
6	Early Maz. Beans, 3 pecks per acre, at 6s. per bl.	1	7	0
12	Oats, 1 buſhel per acre, at 3s. per bl. - -	1	16	0
13	Barley, 1 buſhel per acre, at 3s. 6d. per bl. -	2	5	6
12	Vetches, 1½ buſhel per acre, at 6s. per bl. -	5	8	0
	Total	£.34	6	0

	£.	s.	d.
Seed in the broad-caſt huſbandry	134	10	6
In the drill huſbandry - - -	34	6	0
Saving in the ſeed-corn	£.100	4	6

I muſt not omit mentioning another remark in Mr. Wimpey's obſervations upon my letter, as it might otherwiſe tend to miſlead your correſpondents. He affirms, that the additional tillage neceſſary for the drill ſyſtem, more than counterbalances the advantages to be derived from the ſaving of ſeed-corn. Mr. Wimpey, I have no doubt, expreſſed his real ſentiments, but he appears to me to have been totally ignorant of the new ſyſtem of huſbandry. With Mr. Cooke's Scarificators, Cultivators, and Quitch-Rake, I can completely pulverize, and cleanſe from weeds, any given quantity of land, at little more than a quarter part of the expence neceſſary to make an equally-good fallow with the common implements of huſbandry.

Mr. Wimpey was alſo poſitive, that a greater produce of barley might be procured from three buſhels of ſeed ſown broad-caſt, than from two buſhels ſown with the drill. What two buſhels of drilled ſeed might yield per acre, I know not; but, from nearly twenty years experience, I am confident that one buſhel of barley, wheat, peas, beans, or oats drilled per acre, will give a much greater and heavier crop of either of thoſe grains, than any proportion of them ſown broad-caſt.

My ſole motive for ſtanding forward in this buſineſs ariſes from an ardent wiſh to promote the agricultural (viz. the moſt important) intereſts of my country; and to adminiſter to the wants of my poorer fellow-citizens, by ſaving about 8,000,000 buſhels of wheat, 3,000,000 buſhels of barley, 1,000,000 buſhels of rye, 4,000,000 buſhels of oats, and 1,000,000 buſhels of beans and peas, which are yearly thrown away in ſeed-corn, independent of the additional produce, which by the new ſyſtem might be obtained. Theſe laſt calculations cannot be ſuppoſed to be accurate, but I ſhould hope the aggregate would not be very erroneous.

A field of drilled turnips was partly ſown the firſt week in July, and the remainder in the ſecond week. Before Michaelmas, no appearance of intervals could be ſeen, and the whole field exhibited the fineſt and moſt regular crop of turnips I ever beheld; many of them weighed 25lbs. each, and meaſured 3 feet 3 inches in circumference. Agriculturiſts and farmers from many parts of the country viſited my little farm laſt year, and all were aſtoniſhed at the regularity of the crop, and the ſize of the plants. I believe the average weight of each turnip muſt have been 12 or 14lbs. The acreable weight I aſcertained by weighing a few rods, and found it amounted to 55 tons.

One field was fallowed for two years, and dreſſed very highly. In September 1795 it was put on to ridges, 4 feet 8 inches wide, excluſive of the furrow. The laſt day of September, or the firſt of October, every other ridge was drilled with red wheat, a little more than 3 pecks per acre, 11¼ inches from row to row. It was twice horſe-hoed in the ſpring, and the 4 feet 8 inches fallow ridge was ploughed up to the wheat and back again, and then one furrow was thrown up to each outſide ridge on which the wheat was drilled. The wheat was ſo very luxuriant, that it was lain in the graſs, and I was obliged to feed it with ſheep until the middle of April. One row of potatoes was then planted in the centre of the fallow ridge: theſe were ploughed between, and well hoed. The produce of the two acres of land was, wheat ſeven quarters and three buſhels per acre; potatoes per acre, one row on each fallow ridge, fifty ſacks.

The following year, the potatoes were grown on the ridge occupied by the wheat the preceding year, and the wheat upon the fallow ridge where the one row of potatoes grew. Both crops looked equally ſtrong and good the ſecond year, but I was too ill to attend to the experiment, and never could aſcertain the reſult of it. But there can be no doubt, but by thus alternately cropping and fallowing, the land would improve every year. I made a ſimilar experiment in an adjoining field, truſting entirely to pulverization, without manure. From this field I had taken two ſucceſſive crops of potatoes, without any dreſſing; both crops were very good.

[ANONYMOUS.]

In the broadcaſt method the land is often ſown in bad tilth, and always ſcattered at random, ſometimes by very unſkilful hands. In drilling, the land muſt be in fine order; the ſeed is ſet in trenches drawn regularly, all of nearly an equal depth, and that depth ſuited to the nature of each kind of ſeed. Theſe ſeeds are alſo diſtributed at proper diſtances, and by being equally and ſpeedily covered, are protected from vermin and other injuries; ſo that the practice of the garden is here exactly introduced into the field.

Again; When thus ſown, there is no meddling with the crop afterwards, becauſe its growth is irregular. The ſoil cannot be broken to give it more nouriſhment, nor can even the weeds be deſtroyed without much inconvenience and injury. But in the drill-huſbandry, the intervals between the rows, whether double or ſingle, may be horſe-hoed; and thereby nouriſhment may repeatedly be given to the plants, and the weeds almoſt totally deſtroyed.

The very ſame effects which digging has upon young ſhrubs and trees in a garden, will reſult from horſe-hoeing in a field, whether the crop be corn or pulſe; for the reaſon of the thing is the ſame in both caſes, and, being founded in nature and fact, cannot ever fail. In drilling, no more plants are raiſed on the ſoil than it can well ſupport; and by dividing and breaking the ground, they have the full advantage of all its fertility——If the expence of horſe-hoeing be objected, there are two anſwers which may very properly be made. The firſt is, that this expence is much leſs than that of hand-hoeing, were it practicable, or of hand-weeding. The ſecond is, that it is more than repaid by the quantity of ſeed ſaved by drilling; to ſay nothing of the extra quantity and goodneſs of the crops, which are generally ſelf-evident.

Wheat sown and managed in a peculiar way.

[*By a Member reſiding in Cornwall.*]

In September wheat was ſown amongſt turnips, and covered by hoeing, hurdled and eaten off by ſheep late in April; immediately afterwards the ground was ſown with graſs ſeeds, which were harrowed in: the produce of wheat was twenty buſhels, or very nearly, to an acre. The land a ſandy gravel, in a very high ſituation, and totally unfit for wheat in general; but this was allowed to be as good a crop, by farmers in the neighbourhood, as if the land had been fallowed. Lime was put on before the turnips were ſown; the root of the graſs was good, but the ſummer following was ſo dry, that it was forced to be paſtured inſtead of mown, which circumſtance ſhews how unfit the land was for the culture of wheat in a common way.

[*By Mr.* HAZARD, *of Holt.*]

The farmer who may be tempted to introduce the hand or horſe-hoe through every part of his arable land, would find very little occaſion to make uſe of manure, and might totally extinguiſh both winter and ſummer fallows. If he doubt the truth of this aſſertion, let him try the hoe upon one half, or a leſs part, of his ploughed land, without any manure, for five ſucceſſive years, and cultivate the other part of his farm agreeably to his uſual mode, for the ſame term of years; and I pledge myſelf that double the crop will be obtained from the land whereon the hoe has been effectually uſed, to that which can poſſibly be raiſed upon any lands that are manured and fallowed, or cultivated, in the old or common way.

A near relation of mine cultivated a field for upwards of twelve years as follows, and had every year uncommonly large crops:—His courſe was peaſe ſowed in drills, gathered green; afterwards turnips, both well hoed; then in the ſpring wheat ſown broad-caſt; after the wheat, ſpinage in drills well hoed, and garden beans. The ſpinage was part ſent to market, and part given to cows, and was cleared by the middle of May. The ground then received another hoeing, and on the ſame drills where the ſpinage grew, cabbages (that had been previouſly raiſed in a ſeed-plot) were planted. The beans ſtood for ſeed. The cabbages were carried from the land, and given to milking cows about the month of February. The ploughing commenced for the fourth year immediately after the cabbages were removed; and after the ground was well pulverized, peaſe were ſown in drills three feet aſunder; theſe were gathered and ſent to market in the pod, and after the haulm was removed, coleworts (which had previouſly been raiſed in a ſeed-plot) were planted, about twelve inches diſtant from each other; theſe were a good crop, and were ſold to the cow-keepers.—Thus were eight profitable crops obtained in four years, more than twice ſufficient to pay for the fee of the land.

QUERIES *propoſed by* Sir William Langham Jones, *bart. to* Robert Proctor Anderdon, *esq; with* Mr. Anderdon's *Anſwers.*

1*ſt.* At how much an acre does the adjacent land of the ſame quality let?——*Anſwer.* From 5s. to 12s. per acre.

2*dly.* Are the ſtones much, or any, impediment to the ſucceſs of the experiments?——*A.* The ſtones in Mr. Anderdon's lands are calcareous; and he has an idea (but muſt leave it to chymiſts and philoſophers to decide upon the fact) that their effervеſcence, on the change of weather, contributes to the fermentation neceſſary to vegetation.

3*dly.* Does Mr. Anderdon think that the ſame advantages might be expected from the horſe-hoeing huſbandry when tried on flinty ground, as from his ſtoney land?——*A.* Mr. A. has had no experience himſelf on flinty land; but unleſs the ſtones are ſo large as to obſtruct the operation of the plough and horſe-hoe, he thinks ſuch lands well adapted to the horſe-hoeing huſbandry.

4*thly.* At what diſtance are his rows of wheat, and alſo the plants in each row?——*A.* He drills two rows, a foot aſunder, on a ridge five feet wide, of courſe leaving intervals of four feet for horſe-hoeing. The ſeed is ſhed in the rows promiſcuouſly, but regularly, by Willy's drill-plough, at the rate of from two pecks to a buſhel per acre; and he is of opinion, that the medium between the two is preferable to either extreme, if the land be well tilled, and the ſeed ſown in proper ſeaſon, having due time for the plants to tiller.

5*thly.* Is the ſame row planted every ſecond or every third year?——*A.* The wheat is drilled on the ſame ground every ſecond year; and Mr. A. continued that mode to advantage eleven ſucceſſive years, in the ground above alluded to; his tenth crop producing eighteen buſhels an acre, and his eleventh crop ſixteen buſhels per acre, after great devaſtation from mice; the crop remaining in the mow almoſt two years.

6thly. Does he manure the ground? If ſo, how often, and what is the manure he uſes; and how often in the year is the fallow ploughed?——*A.* He manured the ground for the firſt crop with twelve hogſheads of lime per acre, and eight putt or cart loads, of this country, of rotten dung, to three acres and a quarter, at the expence of 20s. 4d. per acre. For the ſixth crop he manured again with twenty hogſheads of lime an acre, mixed with forehead-earth* and the rubbiſh of an old lime-kiln, at the expence of 1l. 19s. an acre. And he uſed no other manure for eleven crops, except about twenty loads of earth and rubbiſh at another time, on a ſmall portion of the field where the natural ſoil was remarkably thin, which (if charged to the whole field) would not be 2s. per acre at the utmoſt; the whole expence of manure for the eleven years amounting to nearly 5s. 7d. per acre per annum. Mr. A. has ſometimes ploughed or horſe-hoed his alleys only twice during the growth of his crop, but it ſhould be repeated three or four times at leaſt; the earth cannot be kept in too friable a ſtate.

7thly. How many years has the wheat-field been under this courſe of huſbandry?——*A.* Eleven years, as above; the laſt crop was reaped in autumn 1779.

8thly. Does the ſaid field become more fertile according to Mr. Tull's principles, though no manure is put upon it; or does Mr. Anderdon think that it is worſted by ſuch a mode of cropping it?——*A.* Mr. A finds his ground, with the manure as above-mentioned, greatly improved, and is of opinion that, after the above mode of cropping for eleven years, had he carried no manure on the ground, it would have been rendered more fertile than at the beginning; but he does not think he ſhould, in ſuch a caſe, have had crops ſo profitable as with manure; yet he thinks it neceſſary to avoid manuring ſuperabundantly for wheat crops, leſt they ſhould run to ſtraw, and thereby become unprofitable.

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* Head-lands digged up.

9*thly*. What may be the produce of an acre thus tilled? And how much more does he think it would produce, if cropped according to the common mode of huſbandry?——*A*. The crops have been from nineteen buſhels to nine per acre; the average of the eleven crops fourteen buſhels per acre per annum. The crops of wheat in the ſame pariſh, take the good ground with the bad, (and ſome runs to a pound an acre) for the eleven years in queſtion, Mr. A. has been well informed, were on an average not more than fifteen buſhels an acre.

10*thly*. If he thinks the berry [kernel] better and heavier, and ſo liable to ſmut or blight, as if the land were tilled in the uſual manner?——*A*. The berry or grain is certainly larger, fuller, and more perfect, conſequently heavier in every ſenſe. The ſmut has not affected Mr. Anderdon's crops, and attacks chiefly weak corn. For the blight, as there are ſeveral ſorts, ariſing for the moſt part from poverty, all ſuch Mr. A. ſuppoſes the horſe-hoe might remedy; but as to that ſpecies which ariſes from plenitude, he ſuppoſes this huſbandry muſt be, in a degree, liable to, as well as the old.

11*thly*. Whether, on the whole, he has reaſon to prefer this new to the old mode of huſbandry; and whether he thinks any conſiderable tracts of land could be managed upon the principles of the new huſbandry?——*A*. Mr. A. thinks the drill-plough, judiciouſly uſed, a very great acquiſition to agriculture.

12*thly*. With reſpect to Mr. Anderdon's experiments on graſſes, Which does he think will be the beſt to feed ſheep with; and how many more will an acre of ſuch graſs maintain, than it would if in meadow, and cut and given to them to eat? —*A.* Mr. A. is not acquainted with any graſs fit to cut and give to ſheep in preference to their feeding on the ground allotted out to them in parcels by hurdles, where convenient or neceſſary; for which purpoſe he knows no artificial graſs ſuperior to meadow. If lucerne or ſainfoin were cut and carried to them, they would eat the leaves and not the ſtem. But Mr. A. thinks Burnet ſo healthy a graſs for ſheep, that he earneſtly recommends it to all farmers to interſperſe ſome of it in every field ſown with graſs-ſeeds, to remain in paſture.

13*thly*: What graſs does he think beſt for cows, and what for horſes? And whether on the whole, conſidering the difference of the expence, it is an object to turn good meadow or paſture ground into ſuch a mode of cultivation?—*A.* For horſes, cows, and all black cattle, to be cut and carried to them to eat, he thinks Lucerne preferable to any other graſs; and that an acre of it in good ground, where it thrives well, will, from early in May to Michaelmas, maintain twice the number of cattle that an acre of good meadow will. Next to lucerne, for the above purpoſe, comes Sainfoin or French-graſs, but its produce in the ſummer is but little more than half as much as that of the lucerne; yet you may winter-feed the ſainfoin with ſheep till Chriſtmas, and with other cattle till Candlemas. But for the cultivation of theſe, or any other graſſes, by way of raiſing fodder for cattle, (or other purpoſes) Mr. A. has not an idea it would anſwer to deſtroy good meadow, or very good paſture, which from Candlemas to May (the ſcarceſt time of the year) is the moſt valuable of all, and ought to be held in the higheſt eſtimation.

14*thly*. Whoſe ploughs, &c. does Mr. Anderdon uſe; and what authors does he recommend to any deſirous to try the horſe-hoeing and drill huſbandry?——*A.* He uſes the patent plough for general ploughing, and often in the intervals of his drilled crops, but more frequently there leſſer ploughs, nearly on the ſame principal, ſometimes with, ſometimes without, a mould-board, according to the ſtate of the ground and the crop;—-the Kentiſh ſhim;—-ſometimes Hewitt's horſe-hoe;—at others a kind of double cultivator or zull, with mould-boards extendible at pleaſure;—ſmall harrows for the intervals or alleys; Willy's horſe drill-plough, which he has uſed 15 or 16 years, without the expence of ſo many ſhillings to keep it in order. He alſo uſes a ſpiky roller to reduce his heavy clay lands, when perfectly dry only.

As to books, Mr. A. would recommend Tull's Eſſay on the principles of Vegetation and Tillage; Dr. Home's principles of Agriculture and Vegetation; Dr. Hunter's Georgical Eſſays; Randal's Semi-Virgilian Huſbandry; Young's Tours, and alſo his Experimental Agriculture; Dr. Harte's Eſſays on Huſbandry; Duhamel's and Chateauvieux's experiments in Geneva, and Wynne Baker's in Ireland.

Letter from Dr. TISSOT *to Mons.* HIRZEL, *on Bread and Bread-Corn, in answer to Mons.* LINGUET.

MONS. Linguet affirms, that the culture of bread-corn is prejudicial, and that bread is an unwholeſome food.

It is a certain fact that, in ſome countries, one arpent of land ſown with corn yields leſs than the ſame quantity planted with vines, or of good meadow-land; however, this is not owing to the corn, but to the ſoil; for they ſow it with corn, becauſe it is not good enough for meadow-land or vineyards; and if the profits of an arpent of arable be leſs than that of meadow-land, it is becauſe the ſoil of the one is not ſo rich as that of the other. If corn were ſown on a ſoil naturally good, without the help of manures, I am perſuaded that more advantage would always accrue from arable lands than from meadow. The ſame compariſon cannot be made with reſpect to vines, becauſe they muſt have a particular ſituation.

Thoſe diſtricts, where the ſoil will produce nothing but corn, are poor; but in thoſe which furniſh fodder, and alſo fine crops of grain, the inhabitants are wealthy and happy, unleſs they are oppreſſed by taxes.

Flanders, Brabant, ſome parts of Germany and Poland, Milan, and England, which furniſh great quantities of grain, are countries abounding alſo with all the neceſſaries of life, enriched by the money which the exports of their corn bring in return. If there are many poor in them, it is not their raiſing corn that occaſions it; but the unequal diſtribution of it. Whatever commodity a country produces, if it is not enjoyed as private property, but is reaped for others, the inhabitants ſtill continue poor.

If farmers in general ſow more than double what is neceſſary: if they ſow it only in very poor lands; if thoſe lands are badly prepared, and they do not allow the neceſſary quantity of manure; it will be with wheat as with all other crops, it will not grow, becauſe it has not been properly cultivated.

You know, ſir, that the experiments of Mr. Tull, Duhamel, Mougres, and many others, have demonſtrated the advantage of ſowing much leſs ſeed than is uſually ſown; but this method is not a new diſcovery, but has been proved by experience more than an hundred years.

Corn is ſubject to many accidents, but vines are ſubject to many more; and theſe which the vine ſuffers, ſometimes ſpoil the vintage for ſeveral years; thoſe which happen to arable land only ſpoil the harveſt for the enſuing ſeaſon.

Hay is alſo ſubject to frequent and very diſagreeable accidents: the ſecuring it is ſometimes very difficult; and when it is badly made, it becomes very hurtful to cattle.

The care wheat requires in grinding is common to all other ſorts of grain; and the accidents which they are liable to are as many as thoſe of wheat: their produce is not ſo certain; and, finally, the ſtraw of wheat is of more general uſe and importance than that of any other grain.

Maize and millet impoveriſh land very conſiderably.—And with regard to rice, every one knows, that it will not grow without being under water; and that four months out of the ſix that it is in the ground, the land muſt be kept flooded; conſequently the countries where rice is cultivated are very unhealthy; and in the county of Vercil, a man of forty years of age is old and decrepid.

No perſon is more capable of aſſigning the cauſe of the ſubjection of the Roman empire to the Northern powers, than M. Linguet; but he cannot ſurely be ſerious, when he ſays, that they were enabled to conquer them, becauſe thoſe Northern countries produced no corn, and that population decreaſed ſince the introduction of grain.

The armies of Guſtavus Adolphus, Charles the XIIth, and the King of Pruſſia, whoſe food was bread, would be as formidable againſt the Italians of theſe times, (who eat leſs than was eaten in the days of Scipio) as their anceſtors were fourteen hundred years ſince againſt the *Romans*. And as M. Linguet ſpeaks of conqueſts, he muſt know certainly that thoſe Greeks who ſubſiſted on bread, thoſe *Romans* who ate nothing but bread and vegetables in *pottage*, ſubdued all the known world, amongſt whom were many nations who ate leſs bread than themſelves. The *ration or allowance* of bread for a Roman ſoldier was much *more than* what ſoldiers have at preſent; and they were alſo much ſtronger: The allowance to a Roman ſoldier was 64 lbs. of wheat per month, which he was ſtrictly forbidden either to ſell or exchange. They had very ſeldom any cheeſe, bacon, or pulſe; wheat was then almoſt their only food, and the proportion was double what is allowed the ſoldiers in our days: they ate it in bread, in flour-milk, and in thin cakes, and they were not ſubject to epidemic and putrid diſorders, as is but too much the caſe with our armies at preſent.— Bread-corn then did not diminiſh their ſtrength, as one may judge from the weight of the accoutrements which they carried, neither did it make them leſs brave, or in any degree unhealthy; nay, it is very probable, that the moſt certain method of preventing epidemic diſeaſes in the army, where it is ſo difficult to procure good animal food, would be to reduce them to the ſimple diet of the Roman ſoldiery.

It is alſo very doubtful whether thoſe countries were more populous, than they are at this time; it is even very probable, that they were leſs ſo.—Nor were the people of theſe Northern countries without wheat: it was the baſis of their food and their drink: without quoting other authors who atteſt it, ſuffice it to ſay, that Tacitus affirms it in his *De Morib. Germ.* c. 23, 25, 26.

Monſieur Linguet's ſecond remark is, that of nine hundred millions of men, there are ſcarcely fifty millions that uſe corn for their food; but in this he is certainly guilty of a very great miſtake, either wilfully, or through inadvertence; for, although there may be ſome ſmall diſtricts in Europe where rice, maize, buck-wheat, and cheſnuts,* are the principal food of the inhabitants, yet one may aver, that there is not the ſmalleſt province, if we except a part of Lapland, where corn is not the baſis of their nouriſhment. Europe certainly contains not only fifty, but one hundred and twenty millions; and it is not in Europe only that corn is the principal food of the inhabitants.

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* The uſe of cheſnuts, as food, diminiſhes daily; and it is a complaint of the œconomiſts of France, that the cheſnut-trees are much deſtroyed in thoſe provinces where they uſed to be in the greateſt plenty, in order to plant mulberry-trees in their place.

It appears to me as neceſſary that man ſhould have good bread, as it is dangerous to have bad: And it is very ſingular, that there ſhould be, at the ſame time, well-meaning and learned men, who forbid the firſt as a poiſon, while others recommend the latter. Vegetables have always been neceſſary for man.

No nation has ever been diſcovered who lived wholly on animal food. All have made uſe of bread, or ſome equivalent for it; that is ſome vegetable farinous ſubſtance, which prevents the ſatiety of all animal food, and the corruption which would be the neceſſary conſequence; even the bark of fir-trees has been uſed for this purpoſe; but I do not ſcruple to affirm, that of all theſe vegetable ſubſtances, bread made of wheat is certainly the beſt.

What food is ſo proper, ſo refreſhing, as bread? Nothing cloys ſo little. If the fermentation be too great, the bread may be a little acid; this is a defect; but even this defect does not make it leſs wholeſome for many conſtitutions; and M. Linguet is miſtaken, in aſſerting, that of all vegetable ſubſtances, there is none more hurtful, 'more hard of digeſtion, or more heavy in the ſtomach;' he alſo adds, that 'it occaſions the blood to be thick and [illegible], and one of the 'moſt celebrated aphoriſms of phyſic is, that the indigeſtion 'produced by it is certain death.'

The aphoriſm which M. Linguet quotes there, is an error of the leaſt enlightened times. I dare affirm, that no perſon ever died of indigeſtion from bread; and in oppoſition to this quotation, I ſhall bring an authority much ſuperior [illegible] ſchool of Salernum. You know, ſir, that Hippocrates remarks, that in a ſcarce ſeaſon of wheat, when they were obliged to ſubſiſt on other vegetables, many paralytic complaints appeared, the natural conſequence of bad food and relaxed fibres.

Thoſe whoſe food is maize, potatoes, or even millet, may grow to a large ſize, or be tall; but I much doubt, Sir, if any one, who lived wholly on them, could ever write the Political Annals of the ſixteenth century, the Pleadings of Monſ. Le Duc D'Aiguillon, and the Defence of Monſ. Le Comte De Morangier, &c.

If the inhabitants of Europe are, in all reſpects, ſuperior to other parts of the world, it is owing, perhaps, to their great uſe of wheat.

If there are men very lean, withered, and decrepid, in countries where they ſubſiſt on bread, this is not, ſir, becauſe they eat only bread, ſince it is known that the Roman legions lived upon it, and were very healthy; but it is becauſe they do not eat enough of it, or eat that which is bad; either it does not afford nouriſhment ſufficient, or the quality is bad; and they are alſo worn out with hard labour.

If monopoly,* bad regulation, or bad management in the corn trade, bad cultivation, or fraudulent practices, have cauſed Monſ. Linguet to be diſguſted, it is not the fault of the corn itſelf, in which trade fewer would be employed, and on which ſtill fewer ſpeculations would be made, if it were of leſs value, or not of real importance.

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* Monopolies will be carried on in every country, where covetous wretches are found, who are not afraid to attempt it. I have read in the public prints, that a monopoly of hay in one part of the Eccleſiaſtical Territories had reduced them to great difficulties in providing for their horſes. A monopoly of potatoes, maize, or buck-wheat, might be much eaſier made than of hay, and money will always induce the greateſt number of peaſants to ſell that in the morning which ought to ſubſiſt them at noon.

Potatoes are much more bulky than wheat; that is to ſay, there is leſs weight and leſs nouriſhment contained in the ſame ſpace; for this reaſon then, as alſo from their being of a moiſt nature, they do not bear long carriage ſo well, nor are they ſo fit for exportation; and yet they muſt be exported, if there are countries where they are neceſſary, and do not yet grow. The independent gentleman, who is fond of them, may preſerve ſome with care till he can dig freſh ones, which he has cauſed to be planted very early; but I believe the poor cottager muſt be without them, at leaſt three months, and this is a long time.

I ſhall conclude by remarking, that although the culture of bread-corn may not be detrimental, and although bread is a wholeſome food, yet nevertheleſs I am perſuaded, as I have already ſaid, that perhaps (almoſt univerſally) too much land is appropriated to the culture of corn.

A man, for example, who has thirty arpents of arable land, and a proportionable quantity of meadow, ſows, one year with another, twenty arpents, ten to wheat and ten to maize, which is the cuſtom in this country:—For a trial, I ſhould ſow but ſeven; by this method three arpents in each diviſion might be ſet apart to other uſes: Let him ſow three arpents of the beſt land with lucerne, three with ſainfoin, which is perhaps the beſt of forage, becauſe it will grow in bad land; it will laſt twelve years, at leaſt as long as lucerne; it affords better nouriſhment; and for which a little manure, once in three years, is ſufficient.

Now, it is certain, that theſe ten arpents would, one year with another, produce ſufficient to ſubſiſt two horſes and four horned cattle; or, which would be much better, ſeven or eight horned beaſts, of which the profit would be more conſiderable than theſe ſix arpents, if three were ſown with wheat and three with maize, indifferently cultivated; and this would be a certain profit, becauſe having his lands better manured, and being enabled to give them one or two more ploughings, his crops will certainly be more plentiful, and ſubject to leſs caſualties, becauſe the ſtrength of the productions would guard it againſt accidents, and render it more certain; he would have as much grain; he would be enabled to ſell as much or even more, becauſe his cows and the produce of the other three arpents, which I have not yet mentioned, would furniſh him with food, which, according to Monſieur Linguet's wiſh, would ſerve him inſtead of bread; he would then be richer and live better, and his ſubſtance would be ſtill increaſed alſo from the produce of the other three arpents, of which I would wiſh him to make a kind of kitchen-garden, according to the method of the wiſe Kliock.

Of this garden, a part ſhould be ſown with maize, which would enable him to fatten his pigs and poultry; another part with Alſace radiſhes, either the ſpring ſort, or thoſe which are larger; a good proportion with potatoes; the reſt with the yellow carrots, wholeſome pulſe, light and ſavory herbs, which are not too tender, but which require as little care as potatoes and cabbages, and which with very little culture will yield more fine plants than will be ſufficient for his conſumption. The overplus and refuſe of his pulſe will furniſh very excellent food for his ſheep and cows.

Carrots are very uſeful for horſes, and the refuſe of the cabbages may be uſed as an excellent manure; and I doubt not but he would live much better, and be much richer, without more labour; and above all, if to his method he would add ſome other corrections and amendments to his Syſtem of Agriculture, viz.——In the firſt place, (which has been frequently mentioned already) he ſhould never ſow wheat and rye together; for theſe two grains, though of the ſame kind, do not thrive well in the ſame ſoil, nor require the ſame care in the culture, neither do they ripen at the ſame time, and never grow ſo well together as ſeparate.—The ſecond is, not to let his graſs ſtand too long before it is mown; *firſt*, becauſe it has been fully proved that hay is leſs nouriſhing to animals, when it comes to feed; and *ſecondly*, becauſe, as ſoon as the bloſſom drops, the plant is nouriſhed wholly from the roots, which impoveriſhes the land; and *finally*, I wiſh him to keep a greater number of ſheep; but, inſtead of feeding them in cloſe and hot ſtables, where they frequently die, he ſhould feed them in incloſures near the houſe, or in fields bounded by partitions, ſix or ſeven feet high on the north ſide, and five feet high on the other ſides, without any covering, or, if any, only two feet wide on the north ſide. The moſt exact and conſtant experience, for twenty years, proves, that this is the only method of making them thrive well, and of having fine wool and better-flavoured mutton.——Monſ. D'Auberton has proved, that ſheep are neither hurt by cold, nor by ſnow, nor rain, but that too great heat hurts them more than any thing elſe;—an obſervation which is confirmed by the care they take in Spain to drive them from the plains of Andaluſia to the mountains of Old Caſtile, before the ſummer heat comes on.

[*Mr*. WIMPEY.]

Dr. Tiſſot, after deſcribing the method of practice purſued by the wiſe Kliock, adviſes—Never to ſow wheat with rye; the impropriety of this practice is too glaring to need enlarging upon.—Never to let graſs ſtand too long before it is mown; *firſt*, becauſe it has been fully proved, that hay is leſs nouriſhing to animals, when it comes to ſeed; and *ſecondly*, as ſoon as the bloſſom drops, the plant is nouriſhed wholly from the roots, which impoveriſhes the land. This, though not leſs certain than the former, is in general little attended to by the farmer; indeed moſt of them act in direct repugnancy to it, for it is a maxim almoſt univerſally received, that the largeſt crop of every kind is the beſt. Therefore in hay and fodder, quantity in general is preferred to quality. Often the former has ſo much the preference of the latter, that the deſire of a large crop procraſtinates the cutting till the hay is ſpoiled, and in fact the whole crop loſt; for it too often happens that it is not worth the expence.

His laſt remark reſpecting ſheep, requires ſome conſideration. He recommends the keeping a greater number of ſheep. This muſt ever be determined by the nature of the ſoil, and the extent of the farm. He cautions againſt keeping them too hot; which is certainly right, for in extreme hot weather they ſuffer greatly; but it does not follow, as he aſſerts afterwards, upon the authority of Monſ. D'Aubertoo, "that ſheep are neither hurt by cold, nor by ſnow, nor *rain*." That they ſeldom ſuffer by a dry cold, though very ſevere, is certain; nor by ſnow, unleſs it continues ſo long as to injure them, by depriving them of their food; but heavy or long-continued rains are certainly very injurious to them, eſpecially to lambs in October and November, when the winter rains ſet in.——In autumn 1780, I went into the north of Devonſhire, to ſpend a few weeks with a gentleman who cultivated his own eſtate. In October, when the cold rains came on, for many days running, he had one or more young ſheep or lambs brought in, either dead, or in a dying ſtate. They were one and all much ſwollen in the body, without any other viſible difference from thoſe that were well.

In the field, I obſerved, they were much inclined to lie ſtill, till rouzed and put up. I had ſeveral of them brought home and laid by the fire-ſide, and made ſome experiments upon them, but without ſucceſs. At length, I had two or three of them opened, to ſee if I could diſcover any internal cauſe of their malady. All the viſcera appeared to be ſound and perfect, without the leaſt ſign of diſorder; only, as I ſaid, the body was greatly ſwollen. When the knife entered the belly, there flew out a great quantity of rarified air, with a conſiderable noiſe, upon which the body immediately fell to its natural dimenſions; but no unſoundneſs appeared in any of the viſcera.—About ſixty of theſe lambs remaining, I propoſed to the bailiff to try if we could not preſerve the remainder by ſheltering them from the cold rains and damps of the night, by putting them into an airy barn, which was contiguous to the fields, to remain there till it might be thought proper to let them out in the morning. This effectually anſwered the purpoſe, for not one miſcarried afterwards.

Were I a farmer poſſeſſed of a conſiderable flock, I would certainly erect a proper building for the purpoſe. It might be done at very little expence, and a large quantity of manure got from it, eſpecially if the floor were covered with an abſorbent earth or ſand, with ſtraw over it. By this means, all their urine and dung might be ſaved, which would be a great acquiſition; as in common, for the moſt part, it is dropped under hedges, or upon the ſurface of the land, where the ſun and wind readily exhale its fertilizing juices, with little or no remaining benefit to the ſoil.

Expediency of sowing Wheat in the Spring occasionally.

[*By Mr.* WIMPEY.]

IN the enumeration of modern improvements, that of ſowing wheat occaſionally in the ſpring ſhould not be omitted. By *ſpring* wheat ſeems to be meant, by writers on this ſubject, a ſpecies of wheat of a peculiar nature, particularly appropriated to that ſeaſon. Whether there be a real ſpecifick difference between this and the wheat that is in common uſe, or whether it is a diſtinction without a difference—a manœuvre fabricated by the ſingular ingenuity of the times, is more than I am able to ſay at preſent; but I never hear of ſpring wheat at 12s. a buſhel, but Carolina graſs-ſeed at two guineas a quart immediately pops into my head.

But whether ſpring wheat be a ſpecies totally different from the ſorts in common uſe or not, the farmer need not be ſolicitous about it; for I can aſſure him, that every ſpecies of wheat in common uſe among us, if ſown in February, will produce good plump corn, and be ripe and fit to reap in good ſeaſon, as I have repeatedly experienced ſeveral years paſt. I have ſowed red Lammas, white Lammas, bearded or cone, and white wheat from America, all which ſucceeded well.

It is not meant by this to inſinuate, that ſowing wheat in the ſpring is preferable to ſowing it in the autumn. The autumn, *communibus annis*, is on many accounts to be preferred. But I am thoroughly convinced, that when from the unſeaſonableneſs of the weather, the foulneſs of the ground, and not being in proper tilth, it would be imprudent to ſow it, the giving it three or four months fallow at that ſeaſon would give a manifeſt ſuperiority to the crop ſown in February over what might be ſown in November, abſtracted from the conſideration of all injury corn ſown ſo late in the ſeaſon is liable to from froſts, &c. in its young and tender ſtate. I have often ſowed wheat in November, very ſeldom with tolerable ſucceſs, often with bad. I have, therefore left off altogether ſowing ſo late in the year; being convinced, from the experience of ſome years, that February is a much better ſeaſon, independent of the very great benefit accruing from three or four months fallow at that ſeaſon of the year.

Calculations of the Weight per Bushel, and the Number of Grains, of sundry Seeds.

[*By* George Winter, *esq; of Charlton.*]

ONE acre of land drilled at a foot diſtance, on ridges of 8 feet 3 inch. wide, contains in length 505,880 inches.

A buſhel of wheat, weighing 62 pounds, contains 516,000 grains. Dropping one grain to an inch requires leſs than a buſhel to an acre.——A buſhel of barley, weighing 52 pounds, contains 515,000 grains.——A buſhel of poplar or pig peaſe, weighing 64 pounds, contains 107,000 peaſe. ——A buſhel of horſe-beans, weighing 64 pounds, contains 35,000 beans.——A buſhel of oats, weighing 32 pounds, contains 1,260,000 grains.

As all grain, &c. vary in ſize, the number contained in a buſhel will be increaſed or diminiſhed; but the above are the average numbers.

Loss of Weight in Grain, &c.

[*By Mr.* Holt, *of Walton, near Liverpool.*]

Aug. 31, 1789. GATHERED and rubbed a few ears of wheat during a glowing ſun, which being immediately put into the ſcales, weighed 2 ounces 11 drams. Being put into the ſcales again Oct. 18th, then weighed 2 ounces 7 drams.

Sept. 2. Under the ſame circumſtances put into the ſcales 2 ounces and 2 drams of barley; which, being tried again Oct. 18th, weighed 1 ounce and 12 drams.

Oct. 22. Put into the ſcales 6 ounces 3 drams of wheat, which in 24 days loſt 3 drams.

Jan. 8, 1790. Took 2 ounces 2 drams of wheat, which in 32 days loſt after the rate of 2 pounds 15 drams per buſhel.

Aug. 27, 1789. Took a pint-eye potatoe, freſh from the earth and well cleaned, which weighed 2 ounces, 9 pennyweights, and 20 grains. The day following it had loſt 20 grains; two days after 26 grains; in four days more 31 grains; in ten days more, or the end of ſeventeen days, it had loſt 40 grains. But we obſerve it loſt as much the firſt day as the laſt ſixteen; in three days, 6 grains; whereas, in 13 days more, it loſt only 14 grains.

The Farmer's, Grazier's, and Butcher's Ready-Reckoner; a short Table, by which the Weight of Stock, according to the different usages in England, can be ascertained; and the Value of Stock of any Size, with the difference, at once discovered.

[*By the Right Hon. Lord* SOMERVILLE.]

THE many difficulties ariſing from the different modes of calculating the weight of ſtock, namely, by the ſcore of 20lb.—the ſtone of 14lb.—the ſtone of 8lb.—and the hundred, have induced the publiſher to put together a table, by which theſe will at one view be equalized; and another table alſo, by which the neat value of ſtock, from 3¼d. to 7d. a pound, may be inſtantly obtained.

It is well known, that in the London markets the mode of calculating the weight both of ſheep and cattle is by the ſtone of 8lb.; in the north and eaſt parts of England, by the ſtone of 14lb.; and in the ſouth, weſt, and north-weſt parts of England, as well as Wales, by the ſcore of 20lb.—The ſcore therefore, as being the moſt uſual, is adopted, and placed at the head of the ſecond table, which gives the neat value at ſo much a pound, and the others are made in the firſt table to equal this, as before obſerved:—For inſtance,

A value is to be ſet on a fat ox—his weight is firſt laid at 45 ſcore; he is ſuppoſed to be worth, according to the price of meat, we will ſay 6½d. a pound—45 ſcore, that is 64ſt. 4lb. at 14lb. to the ſtone; that is 112ſt. 4lb. at 8lb. to the ſtone; at 6½d. a pound, the value of the ox will be 24l. 7s. 6d.

Or a ſheep whoſe weight is laid at 25lbs. a quarter, that is 5 ſcore, at 7d. a pound, is worth 2l. 18s. 4d.

Should there be occaſion to get at the value of a ſheep or a lamb by the pound, of a leſs weight than the firſt number in the table, 1 ſcore or 20lb. it may be done by taking the *half* of any of the weights ſpecified; or to get at the weight of an ox heavier than the higheſt number, which can very rarely happen, it may be done by taking the *double.*

In calculations of this ſort ſome inaccuracies may poſſibly occur; but as theſe tables were drawn up by a very good accomptant, and have ſince been carefully corrected, the publiſher flatters himſelf none will be found.

TABLE.

Scores.	Stones, at 14lb.		Stones, at 8lb.		Hundred,	
	St.	lb.	St.	lb.	Cwt.	qrs.
20 equal	28	8	50	0	3	2
25 —	35	10	62	4	4	1
30 —	42	12	75	0	5	1
35 —	50	0	87	4	6	1
40 —	57	2	100	0	7	0
45 —	64	4	112	4	8	0
50 —	71	6	125	0	8	3
55 —	78	8	137	4	9	3
60 —	85	10	150	0	10	2
65 —	92	12	162	4	11	2
70 —	100	0	175	0	12	2
75 —	107	2	187	4	13	1
80 —	114	4	200	0	14	1

An accurate Mode of Buying and Selling Whe Weight; illustrated by a Table.

[*By* J. Woods, *gent.*]

IN order to prevent impoſition of every kind, it w neceſſary to eſtabliſh the following regulation, nan oblige the millers and merchants to buy, and farmer their wheat in every market in England by the eight buſhel, ſtruck with a *round ſtrike*, ſuppoſing it to wei nine pounds, or four half-hundreds and twelve po the ſack of four buſhels, excluſive of the weight of tl and the farmers to be accountable for that weight: make up the deficiency of light wheat by adding to th tity, nor by making leſs meaſure of the heavier; but t in proportion to the deficiency, and to be paid over an the price agreed on in the ſame proportion for a aſcertained; and the VALUE of

6d.		6¼d.			6½d.			6¾d.			
s.	d.	£.	s.	d.	£.	s.	d.	£.	s.	d.	£
10	0	0	10	5	0	10	10	0	11	3	0
0	0	1	0	10	1	1	8	1	2	6	1
10	0	1	11	3	1	12	6	1	13	9	1
0	0	2	1	8	2	3	4	2	5	0	2
10	0	2	12	1	2	14	2	2	16	3	2
0	0	10	8	4	10	16	8	11	5	0	11
10	0	13	0	5	13	10	10	14	1	3	14
0	0	15	12	6	16	5	0	16	17	6	17
10	0	18	4	7	18	19	2	19	13	9	20
0	0	20	16	8	21	13	4	22	10	0	23
10	0	23	8	9	24	7	6	25	6	3	26
0	0	26	0	10	27	1	8	28	2	6	29
10	0	28	12	11	29	15	10	30	18	9	32
0	0	31	5	0	32	10	0	33	15	0	35
10	0	33	17	1	35	4	2	36	11	3	37
0	0	36	9	2	37	18	4	39	7	6	40
10	0	39	1	3	40	12	6	42	3	9	43
0	0	41	13	4	43	6	8	45	0	0	46
10	0	44	5	5	46	0	10	47	16	3	49
0	0	46	17	6	48	15	0	50	12	6	52
10	0	49	9	7	51	9	2	53	8	9	55
0	0	52	1	8	54	3	4	56	5	0	58

y given Wei

o 24l. per Load

ight per Sack in the
ng added to the Sun

d.	£.	s.	d.
3	19	2	6

weight, by the following rule; namely, for every pound on the ſack over that weight to be paid the price of a gallon and a quarter of flour per load, (of ten ſacks) and for every pound per ſack deficient to abate in the ſame proportion; for inſtance, ſuppoſe the price agreed on to be 12l. per load, then, in caſe the wheat ſhould weigh one pound per ſack over, the miller would be obliged to pay 12l. 1s. 3d. per load; if two pounds over, 12l. 2s. 6d.

Thus all Wheat would be nearly of the ſame value per load, and ordinary or bad wheat would not be bought ſo much dearer than the beſt; as the price to be paid would be in proportion to the weight or real value, though the price agreed on would be the ſame for the bad as for the good.

Enquiry concerning the Smut in Wheat; of the Cause, Prevention, and Remedy.

[*By Mr.* WIMPEY.]

THE previous queſtion is, what is the *cause* which generally produces the ſmut in wheat?

To this no poſitive or probable anſwer has been given. It has been generally ſuppoſed, if one may judge by the means commonly uſed to prevent it, that it proceeds *from* the ſeed, whoſe *stamina*, by ſome means or other, have been vitiated; for all the means of prevention, I ever heard of, were uſed in the preparation of the ſeed previous to its being ſowed.—The moſt common method is brining and liming the day before ſowing; which is done either with ſea-water, the brine of meat, or of ſea-ſalt diſſolved in water made ſtrong enough to bear an egg. To this ſome whimſical people have capriciouſly added ſeveral ingredients, which are much mor likely to deſtroy the vegetative principle of the ſeed, than to remedy any evil, the rudiments of which might latently ſubſiſt in it. To this purpoſe, flour of brimſtone, aloes, copperas, and verdigreaſe in fine powder, aſſafœdita, and even arſenick, have been recommended to be infuſed in the pickle; but this is ſo very abſurd, and even dangerous, that men of ſober common ſenſe are afraid and aſhamed of the practice.

The practice of brining and ſteeping was ſuggeſted by accident, eſtabliſhed by cuſtom, and continued againſt all reaſonable conviction of its utility. In unfavourable ſeaſons, every one knows, that ſmut generally prevails in ſpite of every precaution that has hitherto been taken.

Some years ſince I ſet a ridge with wheat, by way of experiment, in rows at various diſtances; in the courſe of the ſpring it was hoed two or three times, and was as healthy, vigorous, and fine, as ever was ſeen. In general it was from four to five feet and a half high, the ſtraw uncommonly large and ſtrong, and the ears from four to five inches and a half in length. No corn ever appeared more promiſing. Thus it continued till the bloom appeared, about the middle of June. The weather then became wet and cold, and frequently deprived the corn of what is uſually called its bloſſoms. Before the end of the month, the ears put on a ſickly look, and, upon examination, it was found amazingly ſmutty; more ſo, indeed, than I had ever obſerved any before. In vain I examined the roots, the ſtraw, the joints, &c. all appeared ſound and perfect, till I came to the ear; there the evil began, but from what cauſe, or by what means, not the leaſt veſtige could be found.

As the plants were vigorous, perfectly healthy, and ſound, till the bloom appeared, and then turned ſickly and diſtempered, and at length immoderately ſmutty, it ſeemed very clearly to follow, that it could not be owing to any imperfection in the ſeed, but entirely to the inclemency of the air which by ſome means or other infected the grain in its embryo-ſtate, and converted the milky ſubſtance, which conſtitutes the meal or flour of the corn, into a black, fœtid, unwholeſome powder, known by the name of ſmut.

Moſt of my wheat this year, 1789, was ſown in drills at various diſtances, for the ſake of experiments, and was all horſe and hand hoed. In the months of April and May it was remarkable for height, ſize, vigour, ſtrength of ſtalk, and length of ear. In this flouriſhing ſtate it continued till above the middle of June. About this time the weather grew cold and ſtormy, and continued ſo till towards the end of July, a few fine days intervening. The wheat was now in full bloom, but frequently ſtripped of it by the haſty ſhowers that fell.——Soon after the ſhowery time I obſerved a great number of the ears turned quite brown, as if they were ripe; but upon examination they proved to be abortive ears, without any corn in them; they handled as looſe and ſoft as corn that had been threſhed.

Soon after this, I obſerved the ſouth ſide of one of the fineſt fields was grown very ſmutty. It was ſufficiently diſcouraging to ſee corn five feet high, with ears five or ſix inches long, and to appearance healthy, converted into ſmut. On examining the roots of the ſmutty ears, then the ſtems or ſtraw, the joints, and every part up to the ear, no defect whatever was to be found. I had not proceeded far, however, before I obſerved, that both ſmutty and ſound ears were frequently produced and nouriſhed by the ſame root, and conſequently were both produced from one and the ſame individual ſeed, and it was no very uncommon thing for the ſame ear to contain both ſound and ſmutty corn.

From this ſtate of facts I cannot reſiſt the conviction that the ſmut is cauſed by the inclemency of the atmoſphere, and that conſtantly and invariably in the ſeaſon of its blowing.

The ſmut is not owing to any defect or imperfection in the ſeed, but entirely to ſome corrupt vitiating principle of the atmoſphere, in the blowing ſeaſon, which blights and deſtroys the grain in ſome ſhape or another, according to the time it has been blowing when it is ſtruck with the blight.

From all this it appears, that all the boaſted ſteeps prepared for preventing the ſmut are chimerical, and void of all reaſonable foundation whatever. In warm, dry, healthy ſummers the ſmut is ſeldom if ever found; though the land be ſown with ſeed that is ſmutty, and without any preparation at all. I would, however, recommend waſhing the ſeed in fair water a day or two before ſowing. By this means the light imperfect corns, chaff, and ſeeds of weeds, if any, are ſeparated from the ſeed corn, ſwim at top, are eaſily ſkimmed off, and the remainder rendered much more clean and perfect.

In the year 1787 I took a gallon of ſmutty wheat, and put it into a pail of fair water, and ſtirred it about well for a minute or two with a ſtubbed broom. It made the water almoſt as black as ink. This water was then poured off and a ſecond added, in which it was again very well ſtirred, and then poured off as before. This cleared it entirely from the ſmut and all diſcolouring matter. Then, when it was well drained, it was put into a broad ſhallow pan and ſet before the fire, when in a ſhort time it became dry enough to grind. When dry it was no ways diſtinguiſhable from the cleaneſt and ſoundeſt wheat, but by the ſuperior brightneſs of the colour.

[*Mr.* Wyborn, *of Hull, near Deal.*]

I obſerve an anonymous writer on the ſmut in wheat, who profeſſes to have made it a ſubject of enquiry, aſſert it is cauſed by a cold wet ſeaſon, when in bloom. He muſt have been very inattentive not to have obſerved, that ſmutty ears not only never blow in any ſeaſon, but have never any ſigns of that which, appearing on wheat-ears, is called bloom, and which in ears of wheat are to be found incloſed, by opening the chaff before blowing; but if the weather at that time prove cold and unfavourable, ſo much as to prevent the chaff opening and the bloom from being diſcharged, no grain is produced therein, as it cauſes what is here technically called a *miſs* in the ear. Therefore, if the weather has any thing to do with the cauſe of ſmut, (which I very much doubt) it certainly muſt be in a much earlier ſtate of vegetation than your correſpondent ſuppoſes; for the ſmut is to be diſcovered as ſoon as the wheat is podded; and immediately on the burſting of the pod, if the ear be picked out, it will be found to contain a very ſmall green bud; and if that ear (before ever having been expoſed to the atmoſphere) be rubbed on the hand, it will give out that diſagreeable odour of which we are very ſenſible in the more advanced ſtage of it, but contains not the leaſt appearance of what is deemed bloom in a wheat-ear; therefore, I apprehend, his ſmutty wheat in the cold wet ſummer proceeded more from the preceding damp harveſt, whereby the ſeed was more infected with the diſeaſe (which I have obſerved) than from the ſeaſon in which it grew.——He is very far from having proved that blight is the cauſe of ſmut:—from many years cloſe attention to this enquiry, I am certain it generally is not; for I cannot cauſe a blight, but certainly can the ſmut in wheat, either in a wet or dry ſummer. I never diſcovered any difference in the roots or knots; but it is to be diſtinguiſhed by an attentive obſerver before it comes to ear, having more the appearance of a wild oat than wheat; the leaf is of a darker green, and ſo is the ear on its firſt appearance.

This Gentleman in the ſame letter recommends a new method of ſowing, in which the ſeedſman always caſts before the wind, takes a leſs quantity in his hand, and advances ſeven furrows each time, which is about three times over a warp, exactly as tiles are placed. If in the beginning he proceeds to ſow with his right hand, at the end he advances ſeven furrows, and returns ſowing with his left hand, proceeding alternately with his right and left hands, till the field is finiſhed; the only care required is to deliver the corn thin on the mark, by which method it is in all weathers accurately ſown, and not liable to be hand platted.

I have for ſeveral years drilled the greateſt part of my corn, and have experienced that ſeven inches is the moſt profitable diſtance for the farmer; nine and ten inches is too far (except on very rich land) as in thin land the corn will be too much expoſed to weeds and injury by dry weather. Nothing has depreſſed the ſpirit for drilling ſo much as the fallacious idea held forth and maintained by its enthuſiaſtick advocates, that large crops may be obtained with little ſeed, and rows at a great diſtance; the deſpicable crops I have ſeen from ſuch management could not eſcape the obſervation and cenſure of thoſe of another opinion, when a generous diſtribution of double the quantity of ſeed would not only have prevented the ridicule, but have been doubly advantageous to the theoriſt. Some ſeed may, no doubt, be ſaved, and enough to pay the expence of drilling; I never drill leſs than two buſhels of wheat, ſeven-inch furrows, and three and a half barley. Whatever may have been ſaid to the contrary, I never found the old farmers ſo ſhallow-pated, as to withhold themſelves from what they *ſaw* a ſucceſsful practice; conſequently this mode of drilling is generally adopted in this part of Kent, the event juſtifying the practice.

[*By the same.*]

Nil deſperandum, is a motto that every man who wiſhes to inveſtigate abſtruſe ſubjects, ought always to have before him. Is not ſmut-ball a ſubſtance in its nature generated through a wheat grain and its plant? Strange and abſurd as this hypotheſis may appear to us at firſt ſight, yet if we reflect on the various phænomena in the animal and vegetable ſyſtem, that daily preſent themſelves to us, we ſhall perhaps think it not altogether unworthy of our attention and enquiry.—The oſtrich, we are told, truſts her egg to warm ſand to produce its progeny; the cuckow, we know, in our own country, depends on the incubation of the hedge-ſparrow to produce, and afterwards to its foſtering care to nouriſh, its young, till it is able to procure ſuſtenance for itſelf. We ſee the miſletoe produced and nouriſhed by various kinds of trees; the like of many ſpecies of moſs; cabbage-ſeed producing cauliflowers, and cauliflower-ſeed cabbages, and mules partaking of both. We know divers inſects are produced on and within vegetables; but to come nearer the queſtion—as well as ſmut-ball, cockel grows in the ears that nature ſeemed to have formed for wheat, and (as in ſmut) I have ſeen ears which contained part cockel and part wheat; may not this poſſibly proceed from an imperfect generation? I never knew, or heard it aſſerted, that ear cockel (as it is called) was ever found amongſt wheat, where it was not obſerved in the ſeed before ſowing; that it grew ſpontaneouſly, or was cauſed by an untoward ſeaſon. It is a ſmall, nearly black berry, about the ſize of a ſmut-ball, the flour is greyiſh; that part of the ear which contains them, I am informed, does not bloſſom, as I have obſerved by ſmut; and I do not recollect ever to have ſeen it grow amongſt any wheat but the old Kentiſh brown, of which there is now very little ſown in this part of Kent. I ſhall leave the field open for other opinions, by only ſaying, it may poſſibly be produced in this manner, or be a diſeaſe, as I have obſerved in the laſt volume of Young's Annals.

It is ſufficient for the farmer to know the fact, that ſmut is generally produced by ſmut—at leaſt that it *can* be ſo produced; but how that is effected we muſt leave to Lewenhoc, and other nice obſervers of the works of nature; for whether (as I have ſaid before) it is produced by generation, or is a diſeaſe, is is immaterial, if we know a remedy that will ſtop its progreſs, either by curing the latter, or rendering impotent the former. A ſolution of ſublimate, arſenick, or [illegible] cauſtick alkali, my experience tells me, will anſwer our expectations; that of arſenick is a ſafe, clean, and *cheap* remedy; a firſt conſideration to a practical farmer! But we are told "that it is ſo dangerous and abſurd, that men of "common ſenſe are afraid and aſhamed of the practice." Are then mercury, antimony, opium, and bark, the baſis of the *Materia Medica*, to give place to powder of poſt, becauſe in injudicious hands they have produced the worſt conſequences? and their preſcribers be accuſed of wanting common ſenſe? Surely not. Herculean diſeaſes require Herculean remedies. The ſolution of arſenick has not been uſed only on an acre or two of land by way of experiment, but on *hundreds* of acres, to the entire ſatisfaction of myſelf and other farmers that have uſed it; and they may reſt aſſured (provided the corn be ſown within twenty-four hours after immerſion) that no danger will ariſe to the ſeed, although it may have been many hours in the water, and no lime uſed; but as the weather at that ſeaſon is uncertain, it is beſt to wet it as you have occaſion; fifteen minutes is ſufficient for its being in the water, and it will be dry enough for ſowing in an hour or two after; if any ſuſpicion of ſmut in the ſeed, it may remain ſome hours in the water without injury. I uſe no lime, it drilling better without.

My gardener, a very ingenious Scot, has often aſſured me, that in the early culture of cucumbers in frames, on finding a female bloſſom open and expanding herſelf before any male was preſent, he has had recourſe to a little dry duſt from the border, which in a few days produced as fine a cucumber as the farina could have effected.

[*By* W. R. *Maidenhead.*]

If the injury be owing (as ſome of your correſpondents have ſuppoſed) to the inclemency of the weather at the time of blooming; what ſhall we ſay, when we ſee two adjoining lands for inſtance, in a common field, belonging to different occupiers, who uſed different ſeed, begin their blowing at the ſame time; one ſhall be almoſt free from ſmut, and the other very much injured? This cannot be owing to the atmoſphere, for they have both the ſame. Every grain, when committed to the earth has, or ſhould have, its embryo perfect; and having abſorbed ſome moiſture, a fermentaion commences, and the fixed air in the corn begins its motion, and by a rapid circulation warms the germ and its concomitant parts; ſome part at that juncture receives a check, and a mortification enſues, but in ſo ſmall a way as not to affect the great progreſs of vegetation, till nature has almoſt finiſhed her work.——To prevent this malady, having got good ſeed, limed after the uſual manner, ſow early before the ſevere froſt begins; for I imagine it perforates the grain, and wounds ſome part of it. Sometimes in a very wet morning the lime is waſhed from the ſeed, and this contributes to produce ſmut.

At preſent this is chiefly ideal, not ſufficiently authenticated by experience. The pureſt ſeed, if ſown dry and late in the autumn, will moſt probably turn to ſmut, to the very great loſs of the farmer. We know good and ſmutty corns are produced in the ſame ear.

[*By Mr.* WIMPEY.]

The ſmut in wheat, I have long been of opinion, is generated by a very wet ſeaſon happening during the time of its being in bloſſom. This I eſteem the cauſe and origin of the diſeaſe; but I am well aſſured it may be, and often is, propagated and continued by uſing the corn thus vitiated for ſeed. Laſt year I made ſome experiments on ſmutty wheat, hoping to obtain ſome information I might rely on. I ſowed part of a ridge in drills about twelve inches apart with good ſound ſeed; another part, immediately adjoining, with ſeed taken from very ſmutty corn. It had been previouſly waſhed in two ſeveral waters; what ſwam at top was carefully ſkimmed off, and the waſhing continued till no blackneſs remained. Another portion of the ſame ridge, adjoining the former, was drilled with part of the ſame ſmutty wheat unwaſhed, juſt as it came from the ear, without any preparation whatever; the reſult was as follows:

The crop from the ſound ſeed was perfectly free from ſmut, clean, and good. That from the ſecond had many ſmutty ears among it, perhaps one in twenty. The third and laſt was miſerably ſmutty indeed; I believe half of the ears at leaſt were infected. As all three parcels of ſeed were ſown in the ſame land, at the ſame time, in the ſame manner, and managed the ſame in every ſtage of its growth, it ſeems clearly to follow, that good, clean, ſound ſeed in a favourable ſeaſon will produce good ſound corn; that ſeed infected with the ſmut, though well waſhed in water, will retain a part of the infection, and produce a ſmutty crop; and that ſmutty ſeed, ſown without any waſhing at all, will produce a crop ſo ſmutty as to be of very little value.

[*By the Same.*]

In a former paper on this very difficult ſubject, I obſerved it was no unuſual thing to meet with ears both of ſmutty and ſound corn iſſuing from the ſame root. Alſo, that it frequently happened that ſmutty and ſound grains were to be found in the ſame ear. That I had then by me the corn I had picked out of ſuch an ear. It contained forty ſmut-balls, twenty-one grains that appeared to be perfectly ſound, and five grains which had one end black and ſmutty, and the other ſound. Theſe I made the ſubject of experiment, the reſult of which I now lay before the Society for their conſideration.

On the 2d of September 1789, I put the twenty-one grains above mentioned into a two-ounce phial of pump-water, which I very well ſhook together. It was then ſet by till the next day, when the water was poured off, and the corn divided into two parcels. Having filled a two-quart garden-pot with common mould, ten of the grains were ſet in five holes about two inches deep. The other eleven grains were returned into the phial, being firſt nearly filled with a ſtrong pickle of ſalt and water. After ſtanding 24 hours, theſe were alſo ſet in a garden-pot, in all reſpects ſimilar to the others. My intention in theſe different proceſſes was to diſcover, 1ſt, if corn from a ſmutty ear, merely by rinſing in ſimple water, would produce ſound corn free of ſmut; and 2dly, if a ſtrong ſolution of ſalt and water would more effectually anſwer that deſirable purpoſe, as was generally believed and inſiſted on.

The beginning of December I obſerved the plants ſeemed much crouded, and wanted more ſuſtenance than the ſmall quantity of earth the pots contained could ſupply. On the 8th day, therefore, I took them out of the pots, and planted them in a row in the field, about eight inches apart, keeping, however, the plants of each pot ſeparate. There was no perceivable difference in the plants, both pots had ſhot vigorouſly, and it was truly amazing to ſee the immenſe quantity of roots the pots contained; the ſides being completely lined, with the ſame running round and round, to an incredible length; from whence it ſeems very probable, that the roots of wheat in good land, well pulverized, may extend and collect ſuſtenance at ſome feet diſtance from the parent ſeed.

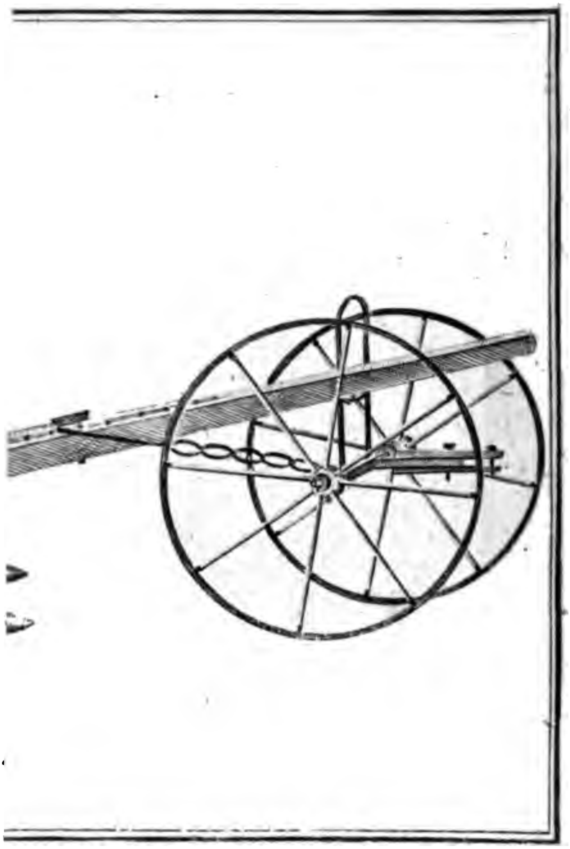
At this ſeaſon vegetation is nearly at a ſtand. It was the end of March, or beginning of April, before the plants began to ſhew the leaſt appearance of recovery from the check occaſioned by tranſplanting; however, they then began to ſhoot vigorouſly, and at length acquired an uncommon degree of ſtrength, length, and ſize of ear, and plumpneſs of grain, and from 12 to 24 offsets or ſtalks from each plant. I reckon I am much within compaſs in ſuppoſing that the produce of theſe 21 grains was not leſs than 15,000, and the grain as plump and fine as ever I ſaw, and every corn perfectly free from ſmut. It would be ridiculous to ſuppoſe that this corn was in any reſpect better than it would have been from ſound and perfect ſeed. Its extraordinary vigour I impute ſolely to its being tranſplanted into freſh ground, well pulverized, which could not fail to give much additional ſuſtenance and ſtrength to the plants, and would probably afford the greateſt produce poſſible on any given quantity of land. But I am ſenſible it could never anſwer the extra expence, nor be at all practicable on a large ſcale, notwithſtanding ſome mere ſpeculative men have wildly imagined the contrary.

From this account, it is as certain as experiment can make it, that a ſmutty crop of wheat is not the neceſſary reſult of ſowing ſeed from corn that is ſmutty; nor that it owes its corruption to any vicious principle or defect in the ſeed. In this experiment we ſee the ſeed, rinſed or ſoaked in ſimple water, produced as clean and perfect grain as that which was ſoaked in a ſtrong ſolution of ſalt and water; and therefore were not in the leaſt tainted by the ſmutty grains in the ſame ear, nor at all affected by the cauſe, whatever it was, that vitiated them; or if they were, that the ſoaking and rinſing in ſimple water was as effectual to the preſervation of the crop from ſmut, as the ſtrong pickle.

In the above experiment, one thing occurred which I muſt not omit, for it well deſerves to be noticed. One part of the ſeed was ſoaked in clear water only, the other in a ſtrong ſolution of ſalt and water. I could perceive no difference in the plants on a comparative view, from the time of their firſt coming up to the maturity of their growth, except in their tillering. The plants in both experiments were equally vigorous, equally tall and ſtrong; the ears equally long, large, and full; and the grains equally plump and heavy: but thoſe ſteeped in the brine tillered out conſiderably more (that is, put out many more ſtalks) than thoſe ſteeped in water only; conſequently were much more productive. What the ſuperior fructification was owing to, is well worth enquiry.

In the next place I made an experiment, with the five grains mentioned above, which were ſmutty at one end, and ſound at the other. Theſe were ſet in a ſmall garden-pot like the former, one of which only came up. In the ſpring it ſeemed to want more room; I therefore dug a hole in the ground, and, taking the mould out whole from the pot, it was planted in the ſame without diſturbing the roots. It ſoon grew vigorouſly, but never had the health-appearance of the former. It had always a ſickly greeniſh yellow look, which betrayed its malady; notwithſtanding its ſtems grew to a good height, and tillered ſurpriſingly. I counted 24 ears from this ſingle grain, moſt of them of a good length, but lank and thin, very unlike the appearance of thoſe ſmutty ears which are not affected till the blowing ſeaſon; for theſe very often are the fineſt and plumpeſt ears in the field, till that time. Of theſe 24 ears, 23 of them were entirely ſmutty, not a ſound corn could be found among them. The other was quite a ſmall underling ear, which did not appear till a full month after the other, but always bore a healthy countenance. This ear produced 14 corns only, and thoſe ſmall and thin, but ſound and perfect. Theſe were planted again laſt Auguſt, and are now as fine and promiſing as any corn in the field.

From theſe experiments of the former paper, the following corollaries are clearly deducible:—That ſound grains, from very ſmutty ears, produce as clean and as ſound crops as ſeed from corn that is perfectly free from ſmut.—That ſeed from the ſoundeſt and cleaneſt crops doth frequently, in wet, cold, unfavourable ſeaſons, produce ſmutty crops, in ſpite of ſteeping, brining, liming, change of ſeed, and every device and invention which the wit of man hath ever practiſed.—That in fine, dry, warm ſummers, it frequently happens there is little or no ſmut at all, and that in many inſtances, where ſmutty ſeed has been ſown, the produce has been clean and perfectly free from the ſmut.—That the ſmut is not an hereditary diſeaſe, proceeding from a corrupt or vitiated ſtamina in the ſeed, but uſually and almoſt entirely occaſioned by ſome blight or vitiating principle in the atmoſphere, which corrupts or deſtroys the vivifying principle, at the time of its blowing and fecundation.—If the ſmut ever proceeds from diſtempered ſeed, it can be only from ſuch as



hath the germ or ſeminal principle ſound and entire; for mere ſmut-balls are as incapable of vegetation as powder of poſt, or the moſt effete matter in nature; but this is a caſe ſo rare as not to be adequate to the production of a millionth part of the ſmut that happens; therefore it muſt generally proceed from ſome malignant principle, which at certain ſeaſons ſubſiſts in the air.—And laſtly, if the cauſe of the ſmut does not ſubſiſt in ſome latent or occult corrupt principle in the ſeed, but is generally occaſioned by the intemperance of the air, ſix or eight months after the ſeed was ſown, it ſeems perfectly nugatory to uſe any means to remedy or prevent a diſorder, which has no exiſtence, even in its cauſe; and moſt probably may never happen, unleſs it could be made appear, that ſuch means beſtowed ſuch a degree of ſtrength and vigour to the plants, as might render them leſs ſuſceptible of any malignant impreſſion from the atmoſphere, which might happen to reign during any future ſtage of their growth.

To give a circumſtantial relation of each experiment would be both tedious and unimportant; ſuffice it then to ſay, they were made with ſound corn picked out of ſmutty ears, ſet at different times and on different ſoils, prepared by ſteeping n different liquors; ſome in ſimple water, and ſome without any preparation at all. The reſult was, that one ſmutty ear was not to be found in any one of the experiments.—Some of the ſeed was ſteeped in a ſolution of ſalt, ſome in a lixivium of wood-aſhes, ſome in a ſolution of ſugar, ſome in ſtrong ale, ſome in clear water, ſome were ſet dry as they came from the ear; but at harveſt there was no perceptible difference, either as to ſtrength of plants, or ſoundneſs and plumpneſs of grain.

There is one experiment, however, I would beg leave to relate a little more particularly.—The firſt experiment I made on ſmutty wheat was four years ago, on ſome ſound corns I picked out of a ſmutty ear of white wheat, ſaid to be originally from Canada. The corn from this ſeed I have continued to plant ever ſince, to try if there would be any return of the original taint, or ſymptom of that diſorder. The produce ever ſince has been not only free from it, but that the grain remarkably plump and fine. In the harveſt of 1790 the whole of it was nearly deſtroyed by birds. I did not ſave a tenth part of it, and that from the weakeſt and lateſt ripe ears; however, I ſaved all I could, and planted it in my garden the Auguſt following; and to prevent a like devaſtation from the birds, I had part of a ridge dug in the middle of a field of wheat reſerved for that purpoſe, and in February following tranſplanted it there in rows, at 9 inches diſtance, and ſix inches apart in the rows; when the plants were about a foot high, they were completely eaten down by the hares, and I thought them deſtroyed irrecoverably; but they ſoon ſhot up again, and at harveſt produced as long and fine ears, and plump, ſound, good corn, as I ever ſaw. The produce was at the rate of 37½ buſhels to the acre, and the weight of the buſhel 72 pounds, nine-gallon meaſure. The ſoil a poor binding loamy ſand, which, if undiſturbed, ſoon grows moſſy. It had borne ſix drilled crops in ſucceſſion, four of them wheat, without any manure whatever.

From this and ſome other obſervations I am convinced no mode of practice would equal tranſplanting as to quantity of produce; but from the great labour and expence, and number of hands it would require, that mode of cultivation on a large ſcale is abſolutely impracticable, and therefore not to be thought of. But to return to our ſubject.

In the year 1790, a neighbour of mine, an intelligent farmer, in a large way of buſineſs, procured a ſample of very fine, clean, ſound wheat, of which he purchaſed enough to ſow a large field. The reſt of his land he ſowed with wheat of his own growth. From the ſeed he had purchaſed he hoped to reap enough good corn to ſupply him with ſeed for his whole crop the following ſeaſon, but at harveſt how great was his diſappointment! The produce of his fine ſeed turned out very ſmutty, whereas the crop from the ſeed of his own growth had little if any in it.

Another farmer, who lived about a mile from me, being rather in low circumſtances, was induced to ſow, the ſame ſeaſon as above, ſome very ſmutty wheat he had by him, it not being convenient to purchaſe good clean ſeed; but his crop proved as clean and as good as any in the neighbourhood, having very little if any ſmut in it. Theſe caſes are far from being ſingular, for many ſuch have come to my knowledge.

[*By Mr.* WAGSTAFF.]

A neighbour of mine at Baburgh, a ſpeculative and practical farmer, walked into a ſmall piece of wheat which I had ſown with blended but common ſtrains of wheat, and in his walk he gathered ſome ears of ſmutty corn; in the examination of which he detected in four of them eight or nine ſound grains; which grains he reſerved, and at the common ſeed-time drenched with brine, which he uſually prepared for his ſeed, and planted them in his garden in the year 1783. Theſe grains produced many ears in 1784, which were generally cloſer ſet, and more numerouſly productive of grain that the frequent ſtrains of wheat. He ſelected the cloſer ſet wheat, and dibbled in their grain, ſeparate from any other; the produce of which was about a quarter of a peck. In 1785 thoſe dibbled in the ſame manner, that ſeaſon, produced in the following autumn about half a buſhel, which produced by the ſame mode about nine buſhels in 1787, which he principally retained, and had dibbled on ſeveral acres; the general produce of which, where he preſerved his wheat unblended, was uniformly of the quality of the reſerved original ears of 1784. In 1788 he diſtributed for ſeed (above his own reſerve) to his relations and friends. I had four buſhels of this unmixed quality, which preſerved its ſpecific appearance, and attracted the notice of many farmers one of whom has ſolicited and obtained from me twenty-four buſhels; and ſeveral buſhels beſide are in reſerve.

For the prevention of ſmut the means are ſimple, and no other than immerſing the ſeed in pure water, and repeatedly ſcouring it therein, juſt before it is ſown or dibbled on the ſoil: whether well, ſpring, or river water, be uſed, it is indifferent; but repeated ſtirring and change of water is eſſential, to remove the poſſible particles of infection that may have imperceptibly adhered to the ſeed. Thus purified, the ſubſequent crop will be perfect in itſelf, and its ſeed (I am perſuaded) ſucceſſively ſo likewiſe, if there are no adjacent fields from whence this contamination may be wafted. Believing that this corrupt ſubſtance of ſmut occaſioned its perpetuation, I took ſome grains of wheat from a ſtock that had been known not to be affected with ſmut; theſe grains I blackened with its duſt, and the ſucceeding ſummer confirmed my opinion, as near half the produce was ſmut-balls.

About two years ſince I was called upon by an intelligent farmer (Roger Treffry) of Devonſhire, who *confidentially* (becauſe he had a ſubſcription in view) laid this ſimple proceſs before me; I was immediately convinced, by comparing what I had practiſed with the principle he advanced.

In conſequence of its uſe I have neither ſeen nor heard of a ſmutty ear in this diſtrict; which, I believe, hath in no preceding year been free from them.—*Norwich*, 1796.

It has been already advanced, that the cure of ſmut in wheat is effected by water alone, either by ſinking a veſſel that contains the ſeed beneath the running ſtream, or immerſion in ſtanding water; under either circumſtance, ſtirring it briſkly, whereby the balls, if any, of this pernicious ſubſtance will float away, or may be ſkimmed off; and if there be not any of them, but ſome of the powder adhering to the ſeed-wheat, this active ſtirring, or bruſhing, may cleanſe it from every particle of this infecting matter; that even black wheat may be thus purified, ſo as to be productive of pure grain. Nevertheleſs, wheat not obviouſly foul had better be preferred; yet one of the moſt judicious farmers in this neighbourhood deems he ſhould run no riſk in taking the moſt ſmutty wheat, when ſubjected to this proceſs; confirmed in his opinion from having obſerved the univerſal clearneſs from ſmut on every acre of wheat in this pariſh, under divers occupiers, where the elementary fluid has been uſed: in which perſuaſion he is more fully eſtabliſhed, from knowing that one little farmer within this pariſh, who laſt ſeed-time was not acquainted with this ſimple proceſs, had his ſeed-wheat cured in the old provincial mode. Some of his neighbours have ſaid, that he had more than a twentieth part brand, (ſmut) and he has acknowledged to me he cannot make ſale of it, unleſs the ſheaves are ſeverally picked previous to threſhing.—*Norwith*, 1798.

[*By Mr.* JENNINGS, *Hartington, Bedfordshire.*]

Nov. 6th, 1789. I divided half a pint of perfectly ſound wheat into two equal parts:—1ſt part, Steeped in ſtrong brine, and dried with quick-lime: *the produce perfectly ſound.* 2d, Rubbed with the black powder out of the ſmut-balls, and ſteeped and limed as the former: *half the produce was ſmut.*

Nov. 3d, 1790. Bought of a neighbour one buſhel of very ſmutty wheat, and divided it into three parts:—1ſt, Prepared with brine and lime made into batter: *produce very ſmutty.*—2d, Sown dry, without any preparation: *very ſmutty.*—3d, Waſhed in three waters, then floated in brine, and dried with quick lime: *nearly clean.*

Oct. 7th, 1791. Two pecks of the worſt of the produce of the laſt experiment were divided into four parts:—1ſt, Steeped one hour in ſtrong brine, and ſown wet: *produce very ſmutty.*—2d, Steeped in water only, and dried with abundance of quick-lime: *not quite ſo bad.*—3d, Sown dry, without any preparation: *very ſmutty.*—4th, Waſhed in five waters, till it appeared perfectly clean, and then ſown wet: *appeared to have but little ſmut, but when threſhed was tailed.*

Oct. 19th, 1792. Divided into four parts two pecks of the worſt of the produce of the laſt experiment:—1ſt, Sown dry: *nearly half ſmut.*—2d, Waſhed in five waters, and alſo in ſtrong lye of wood-aſhes, and then ſmothered with quick lime: *nearly free from ſmut.*—3d, Steeped in ſtrong brine half an hour: *above half ſmut.*—4th, Waſhed in five waters, and alſo in ſtrong lye, and ſown wet: *more ſmut than part ſecond.*

Oct. 20th. Of the ſame wheat, ſowed acroſs a land five rows, containing each 330 grains:—1ſt row, ſteeped in ſtrong lye 20 hours: *had only three ears of ſmut.*—2d row, ſown dry: *about half ſmut.*—3d row, ſteeped 20 hours in ſtrong lime water: *only one ear of ſmut.*—4th row, ſteeped in ſtrong ſalt brine 20 hours: *about two-thirds were ſmut and the ſound ears were not ſo good as thoſe of 2d row.*—5th row, waſhed in five waters, and then in ſtrong lye, perfectly dried with quick lime, kept ſix days, and then ſown: *perfectly ſound.*

Oct. 9th, 1793. 1ſt, Sowed ſix ounces of old ſmutty wheat, the produce of experiment 3, 1791, without any preparation: *produce very ſmutty, and the plants weaker than thoſe from new ſeed.*—2d, Of the worſt of the produce of experiment 3, Oct. 19, 1792, ſowed 1 lb. ſteeped 20 hours, in one quart of water, to which was added one ounce of oil of vitriol, and ſown wet: *a few ears of ſmut.*—3d, 1lb. of ditto, with two ounces of oil of vitriol: *only two ears of ſmut.*—4th, 1lb. of ditto, with three ounces of ditto: *perfectly ſound.*—5th, 1lb. ſteeped 20 hours in ſtrong brine:—*very ſmutty, nearly half and half.*

N. B. By ſtrong brine, I mean to bear an egg.

6th, ½lb. ſteeped 20 hours in ſtrong lime water: *a little ſmut enough to tail the ſample.*—7th, part of the ſame wheat ſown dry: *two-thirds were ſmut.*

I feel myſelf bound in juſtice to mention, that I had the firſt hint of the uſe of oil of vitriol, in a converſation with Mr. Robert D. Hicks, a ſurgeon at Toddington in Bedfordſhire. I have to obſerve here, that in this and in all my experiments the brine ſeemed always to injure the plants through the whole of their progreſs, from their being ſown till harveſt; but as it in ſome degree waſhed the ſeed, the produce by this means might be leſs ſmutty. As this experiment ſeemed to be very ſatisfactory, with regard to the good effect of oil of vitriol as a preventative againſt ſmut, I was deſirous to aſcertain in what proportion it might with ſafety be uſed; and therefore made the following experiments:

Aug. 28*th*, 1794. Choſe forty fine grains of new wheat, and divided them into eight parts: 1ſt, ſteeped 20 hours in oil of vitriol only; 2d, ſteeped 20 hours in oil of vitriol and water in equal quantities: *did not grow.* In both theſe caſes the wheat was ſuſpended by liquid.—3d, Steeped 20 hours in water with one-fifth oil of vitriol. 4th, 5th, 6th, 7th, and 8th, with the proportion of 1-7th, 1-9th, 1-11th, 1-21, and and 1-31 of ditto: *theſe all grew well, as did ſome unprepared.*

But I obſerved that the plants from the prepared ſeed appeared to be the moſt vigorous and handſome; and that the grubs which abounded in the ground, ſeemed to prefer them.

From the foregoing experiments, it appears, 1ſt, That the diſorder is communicated by infection; 2d, That the vitriolick acid deſtroys that infection; 3d, That the quantity ſufficient is as one to 30 by meaſure.—4th, That a much greater proportion may be uſed with ſafety.—5th, That the ſeed ſhould not be ſuffered to dry after it is taken out of the ſteep; but may remain in it ſome time without danger.

ON DEEP PLOUGHING.

[*By Mr.* BARTLEY.]

FROM the experiments and reaſoning of Monſieur Chateauvieux, Du Hamel, and others, I was determined to try the effects of deep ploughing; for this purpoſe I provided myſelf with a very ſtout plough, and began with a piece of land about 5 acres on Briſlington-Common, to which my experiments have been moſtly confined. The ſoil a rich loamy ſand, the colour that of a hazel-nut when fully ripe: the upper ſtratum of a pretty uniform quality, to the depth of from 2½ to 4 feet. In the firſt place, I had to contend with the prejudice of the ploughman, who, for what reaſon he knew not, very ſtrongly objected to deep ploughing; however I ſoon brought him to ſubmiſſion, and not without much labour he performed the buſineſs to my entire ſatisfaction:—the general depth was about nine inches.

After giving the land two other ploughings, which were performed with eaſe and pleaſure to the ploughman, it was cropped with Lammas wheat, and the produce was eſtimated, by ſome of theſe very farmers, at 40 buſhels per acre. The next year it was manured with about 20 putt-loads of a compoſition, conſiſting of half hog-dung, and half virgin periment 3, Oct. 19, 1792, ſowed 1 lb. ſteeped 20 hours, in one quart of water, to which was added one ounce of oil of vitriol, and ſown wet: *a few ears of ſmut.*—3d, 1lb. of ditto, with two ounces of oil of vitriol: *only two ears of ſmut.*—4th, 1lb. of ditto, with three ounces of ditto: *perfectly ſound.*—5th, 1lb. ſteeped 20 hours in ſtrong brine:—*very ſmutty, nearly half and half.*

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But I obſerved that the plants from the prepared ſeed appeared to be the moſt vigorous and handſome; and that the

PRODUCE.	£.	s.	d.
Ten packs of flax, at 5l. 5s. - - - - - - -	52	10	0
Thirty-five buſhels of ſeed, at 5s. - - - - - -	8	15	0
	61	5	0
Deduct expences	42	13	4
Profit	18	11	8

or 3l. 14s. 4d. per acre.

The management of flax is tedious and difficult in theſe parts, by reaſon of the ſcarcity of proper workmen. Thoſe we have are emigrants from the Weſt, and take every opportunity of impoſing on the inexperience of young farmers. Beſides it appears to me that flax-growers ought to make it their ſtaple article, and to conſider the other parts of their farm as in ſubſerviency to it. For the preſent, therefore, I have diſcontinued this culture. If I miſtake not, there is a parliamentary bounty of 13s. 4d. per pack to the growers.

On Jeruſalem Artichokes.—At a conſiderable expence and trouble, I procured of theſe roots ſufficient to plant half an acre of ground, but I have them now in great plenty. I find the produce to be about 480 Wincheſter buſhels per acre; and I think they are about equal in value to potatoes for feeding ſtore-pigs, ſuch as are not leſs than five or ſix months old. For fattening hogs I do not find they are ſo valuable as potatoes. But their chief recommendations are, the certainty of the crop, that they flouriſh in almoſt any ſoil, and do not require any manure, at leaſt for ſuch a produce as I have ſtated. They are proof againſt the ſevereſt froſt, and may be taken out of the ground as occaſion may ſerve.

On Woad.—Having been in converſation with ſome growers of woad, who reſide at Keynſham, a place famous for the manufacture of this valuable dye-ſtuff, it was aſſerted by them, that the growth of woad was peculiar to their ſoil and ſituation; being a blackiſh heavy mould, with a good proportion of clay, but working freely. I ſowed half an acre on the common at Briſlington, an exceeding fine tilth, and a better crop I never ſaw in Keynſham. I could not prevail on any of the Keynſham growers to purchaſe it, although but about two miles diſtant; and not having either apparatus or judgment to manufacture, I ſuffered it to run to ſeed; gaining only from the experiment, that it is of a very eaſy culture, and might be made general, and that the only difficulty is in preparing it for market.

On Coriander Seed.—March 22, 1783, ſowed 10 perch with coriander-ſeed, the ſoil a good ſandy loam.

PRODUCE.		£.	s.	d.
87 pounds of Coriander ſeed, at 3d.	……………	1	1	9
Deduct expences	……………	0	5	10
	Profit	£.0	15	11

Or 15l. 18s. 4d. per acre.

On brining Seed Wheat.—At my outſet in farming, I had frequently ſmutty wheat, until, about ſeven years ago, I adopted the brining method; which, excepting in one inſtance, I have invariably purſued, and ſaving that inſtance my crops have been invariably free from ſmut. The method is this: Mix ſalt with common water till it is capable of bearing an egg floating on its ſurface; introduce the ſeed wheat, well ſtirring it about, ſo that the light imperfect grains and other refuſe matter may ſwim at the top; this muſt be carefully ſkimmed off from time to time, till none ariſe; let it remaiin the ſpace of 12 to 16 hours; after which, drawing off the brine at a ſpigot or cock below, placed there for that purpoſe, take away the ſeed grain, and after ſuffering the remaining moiſture to drain off a little, ſprinkle it with fine powdered lime, or wood-aſhes; it will then immediately be in a proper condition for ſowing.

On Spring Wheat.—April 9th, 1784, ſowed 1¾ acre of ſpring wheat, the produce was 10½ ſacks, or 45¼ Wincheſter buſhels. It being an unuſual ſeaſon for ſowing wheat, brining was forgotten, and the crop proved remarkably ſmutty.

Of this ſmutty wheat I cauſed a buſhel to be ſown unbrined, on half an acre of ground, and a buſhel brined on another half acre; the crop of the brined was free from ſmut, the unbrined very ſmutty.

On recovering Smutty Wheat.—I provided myſelf with a tub conveniently ſhallow, that would well cleanſe about two buſhels at each operation, reſerving a ſuitable ſpace above the grain for the water, placing this under a pump; whilſt one man was pumping, another kept continually ſtirring it about with a broom, the ſmutty water, together with the light grain, overflowing the ſides of the veſſel, till the bulk of grain was thoroughly clean and bright. Thus in a few hours we compleated that part of the buſineſs. Next it was committed to a malt-kiln, for drying; and as I thought a much greater degree of heat ought not to be communicated to it than that of a hot ſummer, I never ſuffered it to exceed the 85th degree on Farhenheit's thermometer. In about 18 hours the drying was finiſhed, and the whole performed greatly to my ſatisfaction; not the leaſt veſtige of ſmut in ſmell or appearance.

On Canary Seed.—March 1783, ſowed one peck of canary ſeed on half an acre of land, the ſoil a mixture of loam and clay—produce eight buſhels and a half.

	£.	s.	d.
Expences	2	3	10½
PRODUCE.			
8½ buſhels Canary ſeed, at 10s.	4	5	0
Deduct expences	2	3	10½
Profit	£.2	1	1½

Or 4l. 2s. 3d. per acre.

On Aniſe.—I have tried ſeveral experiments in the culture of aniſe, but was never fortunate enough to get a crop, it appearing that this climate is not in general ſufficiently warm to mature and perfect the ſeed; the diſtilled plant however, uſing it when in bloſſom, affords a more ſweet and grateful tincture than either the ripe ſeed or eſſential oil.

On Potatoes.—The quantity of land ſix acres and a half, a mellow, deep, ſandy loam, on Briſlington Common; diſtance, drills three feet aſunder, ſets eight inches.

EXPENCES.	£.	s.	d.
Three ploughings, at 5s.	4	17	6
Thirty-five ſacks of ſeed potatoes, at 5s.	8	15	0
Planting, at 3s. 6d. per acre	1	2	9
104 putt loads of manure; compoſition, two-thirds natural mould, and one-third hog-dung, at 2s.	10	8	0
Taking out of the ground	13	0	0
Bringing to market	13	0	0
Three hoeings, at 12s. per acre	3	18	0
Rent	13	0	0
	£.68	1	3
PRODUCE.			
Potatoes ſold	138	5	0
Ten ſacks uſed in the family, at 5s.	2	10	0
Sixty ſacks reſerved for planting, at 5s.	15	0	0
	155	15	0
Deduct expences	68	1	3
Profit	£.87	13	9

Or 13l. 10s. per acre nearly.

On Black Oats, 1787.—The ſame land as in the laſt experiment. The preceding year it had carried potatoes, and received one ploughing for a winter fallow. In February laſt, another ploughing was given, and on the 27th and 28th of the ſame month four Wincheſter buſhels per acre of black oats were ſown; this was earlier by about a month than oats are generally ſown in our pariſh, and I did it with a view to aſcertain the effects of early ſowing. When the oats were ripe, I cauſed exactly half an acre to be cut with the ſickle, and ſheaved; theſe were threſhed out, the produce was 49 Wincheſter buſhels—a quantity moſt amazing in theſe parts.

Briſtol, Nov. 1787.

[*By Mr.* Baker; *July,* 1785.]

RICHARD Winſor, of Berry-Pomeroy, has found out a method of curing the Black-Ruſt in Wheat; which is to let ſuch ruſty wheat ſtand uncut three weeks or more after the uſual time at which people in general cut ſuch wheat.

He attributes the infection to ſmall inſects falling upon the ſtalk in foggy or miſty weather; inſects of a poiſonous nature, that cauſe the ſtalk to ſwell, and the knots of the ſtalk to cloſe; by which means the ſap, which ſhould go to nouriſh the grain, is prevented; and that by letting it ſtand as aforeſaid, the ſun and air will deſtroy theſe inſects; the knots will then open, and as they open, the ſap paſſes up and feeds the grain; which, by letting it ſtand a proper time, will recover and become much more full, and will be near as good in quality, as though no ruſt had happened to it.

On Burnt Ears in Wheat.

TO a queſtion aſked by *Farmer Slouch*, What is the real cauſe of Burnt Ears in Wheat, or Bunty Wheat? A *Lover of Agriculture* ſays, " Black ears in wheat, barley, &c. ariſe from ſeed imperfectly ripened; and tho' ſuch imperfect ſeed may ſink in a ſtrong brine, yet have they not the vegetative principle ſufficiently vigorous to perfect their ſpecies. Moſt farmers are anxious to ſow *new* ſeed; whereas, would

ey give the preference to ſeed of one or two years date,
ne but the healthy and ſtrong would vegetate and grow,
e ſeed that was imperfect rotting in the ground, or upon
ſtriking root, yet dying afterwards before the ear was
rmed: whereas in new ſeed (that is, of the laſt harveſt)
e vegetative principle may be juſt ſufficiently ſtrong to
uſe the roots to ſtrike, and the blade to grow, but not
werful enough for perfecting the ear. Nothing contri-
ites ſo ſatisfactorily to our knowledge as experiment, and
ference to matter of fact. I ſhall only add, that thoſe
elon-ſeeds are preferred by gardeners which have been
eſerved five or ſix years, perhaps more; new ſeed, I ap-
ehend, producing plants greatly luxuriant in vine, with
ale and female flowers ſo defective, that practitioners can-
t ſet the fruit.

J. B——b ſays, Mr. Fletcher of Sheffield (in the Gentle-
an's Scientific Repoſitory, vol. i. p. 111) has given the
lowing obſervations:—' *Burnts*, or *bunts*, are occaſioned
a number of nitrous, ſulphureous, and hetorogeneous
rticles; theſe particles, when mixed together, cauſe a fer-
ntation; whence the aqueous and more ſimple parts are
ſipated, and the other more denſe, corroſive corpuſcles
formed in drops, and fall upon the tender buds of corn;
d being ſuſceptible of abſorbing the ſolar rays, burn and
ſtroy them. As to preventing or eradicating *burnts* or
nts, it ſeems an impoſſibility, they being neither an acci-
ntal nor paraſitical malady; but thoſe lands which abound
th mineral exhalations are moſt ſubject to this malignant
ſtructive malady, and particularly when the ſeaſon is hot."

S——, after ridiculing *A Lover of Agriculture*, and *J.
——b*'s philoſophical reaſons, recommends to ſheepfold the
ad intended for wheat in the beſt manner, and to keep the
nd free from weeds, as the beſt remedy.

An Improver of Nature adviſes the farmer to let his labourer draw from the ſheaves the beſt of the ears of one colour, and to ſow of this wheat enough to produce ſeed for his whole farm; by this means he will have all his wheat uniform, and without doubt free from ſmut.

Farmer Slouch cloſes the article, and is of opinion that burnts are cauſed by inſects, and quotes Chambers's Dictionary to prove that inſects depoſit their eggs in the earth, wood, and the like. He found from ſome wheats brined, or ſoaked with urine and lime, ſcarce a burnt produced; ſome wheat ſteeped in a ſtrong lye made of wood-aſhes and lime, and laid on the barn floor to dry, produced a twentieth part burnt; and ſome of the ſame wheat ſowed dry proved nearly a fourth part burnt. Ten good corns taken out of an ear where the remainder were burnt, when ſown produced only one ear that was burnt out of ſeventy-two.

On Feeding Wheat in the Spring with Sheep.

[*By* P. W.]

THIS practice ought not to be generally adopted, even where the crop is rank, or (as we term it) *winter-proud*; becauſe, in many caſes, it would not anſwer any good purpoſe, but, on the contrary, injure the crop. In ſome inſtances, however, it has ſucceeded, and the advantages are theſe:—it affords ſeed for ewes and wethers when turnips are over, and before the ſpring-feed comes in; it cauſes the wheat to branch out into a greater number of ſtalks than it would otherwiſe do, and, of courſe, the crop is increaſed; by the warmth of the ſheep when lying on it, and the manure they leave, the crop is brought forwarder, and the grain heavier than it otherwiſe would be. In light lands eſpecially, they

reading of the ſheep fixes the earth about the roots of the
orn, and cauſes the ground to retain its moiſture longer in a
ry ſpring.——On the other hand, this practice is liable to
he following diſadvantages:—In ſome lands it checks the
rowth of the corn, and makes the ſecond ſhoots weak and
mall—of courſe the ears will be ſmall, and the grain light in
roportion;—in foul lands and a wet ſeaſon, it gives oppor-
unity for the weeds to riſe above the corn ſo as to choak it.
heep are alſo apt to bite off the knot of the plant.* This
ractice anſwers beſt on clean land, and a light ſoil. Here the
reading of the ſheep is of ſervice; and there is no danger
f the weeds riſing ſo as to injure the crop.

From the cloſeſt obſervation, I find that wheat ought not
be fed down with ſheep, unleſs it be very rank in January;
nd that ſuch only ſhould be fed as was ſown early on land
at is neither rich with dung nor weedy. After it is
d, if the land be clean, a top-dreſſing of ſoot, aſhes, malt-
ſt, &c. will greatly cheriſh the crop. I have experi-
ced this in many inſtances, and can ſafely recommend
e practice.

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* To prevent this, the farmer ſhould turn them in hungry, and
e them out as ſoon as they have filled their bellies. When
ngry, they will eat the leaves of the plant; but when their hunger
ſatiated, they will pick out the knot or crown of the plant, that
ng the moſt ſweet and delicate.

On the Culture and Course of Crops proper for heavy Clay-Lands, &c.

[*By Mr.* A. Young.]

THE turnip huſbandry, wherever well introduced, has proved equal to the great object of the entire excluſion of the ſummer-fallows, and is one leading ſtep to the ſetting them univerſally aſide. I can eaſily conceive that, as huſbandry improves in your counties, ſummer-fallowing, oftener than common, will be eſteemed an improvement; and an improvement with which your farmers, like thoſe of Scotland, may ſit down contented.——It ought to be a great object with the Bath Society, to attempt at once *perfect* huſbandry, which may poſſibly be as eaſily introduced as the other. This perfect huſbandry is to baniſh fallows from wet ſtrong lands, as turnips have baniſhed them from dry ones. The only general crop that will effect this is beans. Suppoſe, therefore, the Society ſhould offer a premium for a courſe of crops to render ſummer-fallowing unneceſſary on ſtrong lands, leaving the rotation of crops to the candidate; only ſpecifying the following as practiſed in different parts of the kingdom with great ſucceſs:

1 Beans	1 Beans	1 Cabbages
2 Wheat	2 Oats	2 Oats
3 Beans	3 Clover	3 Clover
4 Wheat	4 Wheat	4 Wheat
5 Beans	5 Beans	5 Beans
6 Wheat	6 Oats	6 Wheat.

With reſpect to wheat, if the land be good, the mere article of leſſening the quantity of ſeed, ſo profuſely thrown away in the broadcaſt method, will increaſe the crop. But would not this effect ariſe from ſimply ſowing a leſs quantity, as it is much cheaper than ſetting by hand? Much more, might I aſk, would it not flow from Mr. Ducket's huſbandry? That of trenching (very ſhallow) clover leys, ſo as to admit his furrowing-plough, and by that means drill as ſmall a portion as you pleaſe, at nine inches equi-diſtant.

[ANONYMOUS.]

There is no profit in a bad crop; for although it coſts little, it not only yields little, but leaves the land in worſe condition than it was before ſuch crop. I now occupy a field which yielded me eight good crops ſucceſſively in as many years; though before I took it, by being too often cropped, and by careleſs management, it became ſo foul as to produce only eight buſhels of wheat per acre. This change was effected by keeping it clean, by ſeaſonable ploughings, and a ſuitable courſe of crops. Firſt, I made a fallow, and manured it with dung. My courſe of crops were,

1. Turnips; 2. Barley; 3. Clover; 4. Wheat.

I then ploughed up the land, and gave it four dry tilths, with a ſowing tilth before I ſowed it in the ſpring. My fifth crop was oats; the ſixth, clover and rye-graſs; the ſeventh, peaſe; and the eighth, barley. But this land lies near a large town, and had been mended with town-dung for many years. I ploughed it as deep as the ſoil would admit. The ſoil was a mixed one, conſiſting of clay and under-loam; and part of it had a gravelly bottom, neither too dry nor too wet.

It appears to me, that in many inſtances, it is the ſuitable *mixture* of manures that makes the improvement, rather than any thing elſe we can account for. We find the chalk and clay are as poor ſoils as any we know of; yet I have found that by mixing theſe properly, and laying ſuitable quantities on as poor land as any in Eſſex, the land yielded as good a crop as any I ever ploughed. I am therefore of the opinion there might in the ſame manner be found a proper manure for our ſtiff clays; and when it is made rich enough, the courſe of crops Mr. Young has mentioned would do very well.

[ANONYMOUS.]

We begin by making a good fallow: what I mean by a good fallow is, to turn in the ſtubble as ſoon after harveſt as an opportunity offers. In the ſucceeding ſummer, plough it four or five times clean, and as deep as the ſoil will admit of; at leaſt ſo deep as to turn up the thiſtle-roots, and the ſpear-graſs, that lie in the good ſoil. The ſecond year ſow barley; the third year make another good ſummer fallow; the fourth year ſow revits, (red lammas wheat;) and in the month of March throw in ten pounds of red clover-ſeed per acre; the fifth year feed it all ſummer with horſes and ſheep; the ſixth year make a good fallow. The pooreſt clays will, by this method of heating them, get better without any manure.

But ſuch clay lands as are well improved, and will bear it, we treat in a different manner. After a good fallow, we ſow barley with clover, and feed the clover till the middle of June; then ſhut out the cattle, and feed the clover. At Michaelmas we break it up, and ſow wheat, harrowing the wheat in. Where the clay lands are good, we have found the following courſe of crops for twenty years do very well:

1ſt *Year*, Fallow
2d, Barley with clover
3d, Clover-ſeed
4th, Wheat
5th, Fallow
6th, Barley
7th, Peaſe or beans
8th, Wheat
9th, Fallow
10th, Barley and clover

11th, Clover
12th, Wheat
13th, Fallow
14th, Barley
15th, Beans, or Peaſe
16th, Wheat
17th, Fallow
18th, Barley
19th, Ditto
20th, Wheat, or Barley.

This courſe of crops I confine only to ſtrong or ſtiff clays. he principal manure we have yet in uſe is town-dung, and e dung that ariſes from farm-yards, mixed with earth dug on the borders or under the hedges. What I wiſh to ve underſtood by *clay*, is only ſuch as is well filled with alk ſtones, whether large or ſmall. All ſtiff ſoil, without alk-ſtones, we call loam, or brick earth. Theſe ſoils we end with clay, and find the greateſt improvement from it.

[*By Mr.* White Parsons, *West-Camel.*]

I take up my pen, to diſcloſe to you my ſecret of con- rting *clay* into *gold*, which I have found to be the beſt ma- re for dividing and improving ſtrong, ſour, and ſwampy ay land;—and is as follows:

In the months of February and March, the ground in- nded to be improved ſhould be trenched in the following anner:—Let the principal carriage trenches be at leaſt three t deep, and two feet and a half wide, and the leſſer ones hteen by fourteen. In digging them, throw the firſt ſpit, be- turf, regularly on one ſide, and the bottom ſpit, being clay, uld be laid in heaps on the other ſide of the trenches, to e the ſun and air. When you begin your work, if your und be incumbered with thorns, furze, &c. they, when bbed up and dry, may be uſed as part of the fuel which l be wanted to burn the earth; and in the month of May ſhould begin by taking a few loads of your worſt clay, and with it make a circular floor or foundation, about a foot thick, to prevent burning the ſurface of the earth under the intended heap. In the middle of your floor put three or four large billets of wood almoſt upright, bearing againſt one another, and round throw ſmall faggots, roots, and bruſhwood, intermixed with a little cleft wood, as if you were building a pile, to the height of about ſix feet; after this begin to bring, in your three-wheel one-horſe carts, the turf or clods round your floor, with which you build a kind of kiln, regularly, as you would a wall, cloſe to the heap of wood, circularly all around it, and of the ſame height with it. Your wall muſt be about eighteen inches thick. In your wall, at the bottom of your kiln, leave at equal diſtances three or four vent-holes, about two feet wide, and two feet high, placing three or four ſticks acroſs each vent-hole, like lintels over windows. The building being thus finiſhed, you muſt throw four or five loads of the drieſt turf on the crown of the pile. When all is thus in readineſs, with ſtraw kindle the fire at once at all the vent-holes; and when you think that the whole pile is on fire, you are to ſtop up entirely the vent-holes, walling them up with turf, like the reſt of your heap; then, from time to time, you muſt ſupply your heap with the quantity of turf and clay that you will find neceſſary, which you muſt gueſs at from the ſmoke that comes out of the top at the heap. If it ſmokes furiouſly, it is a ſign that the fire is too quick, in which caſe you muſt throw clay in greater plenty, which will force the heat thro' the ſides; but if the ſmoke comes out but very ſlowly, you muſt ſtop your hand, and give the heap a little air, by making holes through the crown of it with a long ſharp ſtake, and afterwards throw gradually and with judgment clay and turf alternately. When, by throwing, you have raiſed your heap as high as you can conveniently, and the fire has nearly reached the top, you muſt rake down the red-hot aſhes with a long dung-crook, covering them immediately with turf; meanwhile the wall will be burning through, and to ſupply the place of it a new one muſt be built likewiſe of turf againſt the old wall before it is quite conſumed, which will keep the heap together, and by often pulling it down prevents its burning too faſt. A heap of ſixty or ſeventy feet in circumference will keep two or three carts employed to fetch turf and clay, and will burn five hundred loads of aſhes in a week. The fire muſt be watched conſtantly, at all times, late in the evening and early in the morning; and one Sunday in a year we generally have our good paſtor's leave to ſpend unholily, in preventing the fires from burning too quick, which, for example's ſake, he has often thought proper to ſanction with his own hands. Sometimes the fires burn ſo faſt that five or ſix men are wanted continually to throw up clay to moderate its heat, and prevent its burning through.

Dry ſummers are the moſt convenient for this work; wet ſeaſons only delaying it, as large fires, after two or three days burning, are never put out by rain, and the aſhes are more carbonaceous and fertilizing, the ſlower they are burnt. The ant-hills, if there be any on the land, ſhould alſo be cut clean up, (not thrown) and burnt with the clay, out of the trenches, ditches, pool banks, and other offenſive matter which moſt fields are incumbered with, and which generally affords a calcareous dreſſing for the ſame land of forty or fifty large put-loads per acre, and, as it were, *free* of coſt; as the coſt of draining, grubbing, hill-throwing, and removing the clay off the land, would be otherwiſe incurred in the courſe of common huſbandry. By this mode I have raiſed a farm from 19l. a year to 60l.; which will in a few years be worth 100l.——*Oct.* 3, 1796.

On the Cultivation of Barley.

[*By* J. S. *S—m*, *Norfolk.*]

THE beſt ſoil for barley is that which is dry and healthy, rather light than ſtiff, but yet of ſufficient tenacity and ſtrength to retain the moiſture. The beſt ſeed is of a pale lively colour, and brightiſh caſt, without any deep redneſs, or black tinge at the tail. If the rind be a little ſhrivelled, it is the better: for that ſlight ſhrivelling proves it to have a thin ſkin, and to have ſweated in the mow; and if the ſeed be not frequently changed, it will grow coarſer every year. It has generally been thought that ſeed-barley would be benefited by ſteeping; but liming it has, in many inſtances, been found prejudicial. Sprinkling a little ſoot with the water in which it is ſteeped, has been of great ſervice, as it will ſecure the ſeed from inſects. In a very dry ſeed-time, barley, that has been wetted for malting, and begins to ſprout, will come up ſooner, and produce as good a crop as any other.

If you ſow after a fallow, plough three times at leaſt. In March ſplit the ridges, and lay the land as flat as poſſible, at the ſame time harrowing it fine. But in ſtrong wet lands (if you have no other for barley) lay it round, and make deep furrows to receive the water.——We ſow on our lighteſt lands in April, on our moiſt lands in May; finding that thoſe lands which are the moſt ſubject to weeds, produce the beſt crops when ſown late. The common method is to ſow the barley-ſeed broadcaſt at two ſowings; the firſt harrowed in once, the ſecond twice; the uſual allowance from three to four buſhels per acre.

From our great ſucceſs in ſetting and drilling wheat, ſome of our farmers tried theſe methods with barley, but did not find it anſwer their expectations, except on very rich land. When the barley is ſown and harrowed in, the land ſhould be rolled after the firſt ſhower of rain, to break the clods. This will cloſe the earth about the roots, which will be a great advantage to it in dry weather. When the barley has been up three weeks or a month, it is a very good way to roll it again with a heavy roller, which will prevent the ſun and air from penetrating the ground to the injury of the roots. This rolling, before it branches out, will alſo cauſe it to tiller into a greater number of ſtalks; ſo that if the plants be thin, the ground will be thereby filled, and the ſtalks ſtrengthened. If the blade grows too rank, as it ſometimes will in a warm wet ſpring, mowing is a much better method than feeding it down with ſheep; becauſe the ſcythe takes off only the rank tops, but the ſheep being fond of the ſweet end of the ſtalk (next the root) will often bite ſo cloſe as to injure its future growth.

[*By the Rev. Mr.* HOWMAN.]

A ſmall incloſure, containing 3 acres, 1 rood, 2 perches, which had been under turnips the two preceding years, was ſown with common barley, excepting one ridge of land in the middle of it, containing 20 perches, which was ſown with Siberian barley the ſame day. The ſoil was very dry, and much inclined to a gravel, and the ſtate of the experiment as follows:

	Seed per Acre. Buſhels.	*Produce per Acre.* Buſhels.	*Weight per Buſhel.* Pounds.	*Total Weight per Acre.* Pounds.
Common Barley,	3	36½	52	1898
Siberian Barley,	3	32	58	1856

Exceſs of meaſure in favour of the common barley, 4½ buſhels.

Exceſs of weight in favour of the common barley, 42 pounds.

A few particularities attended the growth of the Siberian barley, viz.—1. During the firſt three weeks after the corn came up, the Siberian was of a much deeper green, and had a much broader blade, than the common barley; after that time the difference graduallydiminiſhed. 2. The Siberian was in all its ſtages a fortnight forwarder than the common barley. It was mowed and houſed accordingly. The ears of the Siberian were much ſhorter than thoſe of the common barley, being only from five to nine grains in length; whereas the ears of the common barley were from nine to thirteen.

The concluſion which I draw from theſe two circumſtances is this, that the Siberian requires richer land than the common barley. In my land, there appeared to be ſufficient ſtrength to produce all that luxuriance of growth which ſeems natural to the plant while in the graſs, but not ſufficient to ſupport it in forming the ear. I am the more inclined to think this, having ſeen ears of Siberian barley of ſeventeen grains in length, which is the greateſt length I remember to have obſerved in the common barley. It is, however, to be obſerved, that in this experiment, as the weight of the grain of the Siberian ſo far exceeded the weight of the grain of the common barley, as *almoſt* to compenſate for the great deficiency of meaſure per acre, the weight of the flour of the Siberian barley per acre would probably have been found equal to, if it had not *exceeded*, the weight of the flour of the common barley.——Two things want to be aſcertained by well-authenticated experiments, viz. the quality of Siberian barley in malting; and the quality of beer made of that malt.

[*By the Norfolk Society.*]

The intention of the Norfolk Society being to aſcertain the poſitive produce of the grain, and alſo the comparative produce in the two methods of ſowing in broadcaſt, and of ſetting by the dibble, the following experiments were made:—The ground choſen had been in graſs three years at the autumn of 1772, when it was broken up. In the ſummer 1773 it bore oats, and in autumn had three ploughings; in the ſpring of 1774 it was ploughed three times more. Being then in good order, it was divided into two parts.

No I. contained 3 roods, 2 perches, 9 ſquare yards. This was ſown with Siberian barley, by dibbling, from the 9th to the 13th of May 1774. The diſtance of the holes was about ſix inches one way, and four the other. The directions given were to drop not more than two grains into each hole, and they were in general executed exactly. The quantity of grain ſown in this part was one buſhel and a handful; the produce was forty buſhels one peck Wincheſter meaſure, each buſhel weighing fifty-four pounds.

No. II. (the other part of the field) contained 1 acre, 4 perches, 10 ſquare yards. This was ſown under furrow with Siberian barley, May 10th and 11th, 1774, by which means this part had one ploughing more than the other; the quantity of grain ſown was four buſhels; this produced forty-nine buſhels Wincheſter meaſure, each buſhel weighing fifty-four pounds.

So far as a ſingle experiment can be concluſive, it appears, 1*ſt.* That on land in good order, the produce of Siberian barley is great. 2*dly.* That the method of ſetting by the dibble is moſt productive, in the proportion of one tenth part.

[*By Mr.* Copland, *near Dumfries.*]

Take out about one-third of the contents of the ſacks of ſeed barley or bere, to allow for the ſwelling of the grain. Lay the ſacks with the grain to ſteep in clean water; let it lie covered with it for at leaſt 24 hours. When the ground is very dry, and no likelihood of rain for ten days, it ſhould lie 36 hours. Sow the grain wet from ſteeping, without any addition of powdered quick-lime; which, though often recommended, can only poiſon the ſeed, ſuck up part of its uſeful moiſture, and burn the hands of the ſower. The ſeed will ſcatter well, as clean water has no tenacity—only the ſower muſt put in a fourth or a third more ſeed in bulk than uſual of dry grain, as the grain is ſwelled in that proportion. Harrow it in as quickly as poſſible after it is ſown; and though not neceſſary, give it the benefit of freſh furrow, if convenient. You may expect it up in a fortnight at fartheſt.

[*By Mr.* CHAPPLE, *of Bodmin.*]

The laſt ſpring (1784) being remarkably dry, I ſoaked my ſeed barley in the black water taken from a reſervoir which receives the draining of my dung-heap and ſtables. As the light corn floated on the top, I ſkimmed it off, and let the reſt ſtand twenty-four hours. On taking it from the water, I mixed the ſeed grain with a ſufficient quantity of ſifted wood-aſhes, to make it ſpread regularly, and ſowed three fields with it. I began ſowing the 16th, and finiſhed the 23d of April. The produce was ſixty buſhels per acre, of good clean barley, without any *ſmall* or *green* corn, or weeds at harveſt.——I ſowed alſo ſeveral other fields with the ſame ſeed dry, and without any preparation; but the crop, like thoſe of my neighbours, was very poor, not more than twenty buſhels per acre, and much mixed with *green* corn and weeds when harveſted. I alſo ſowed ſome of the ſeed dry on one ridge in each of my former fields, but the produce was very poor in compariſon of the other parts of the field.

On Dairy-Farms, Dairies, Butter, and Cheese.

[*By Mr.* DAVIS, *Longleat.*]

EXPERIENCE ſufficiently evinces the extreme difficulty of perſuading *tenants* to believe that they get more (generally ſpeaking) by *feeding* their lands, than by ploughing them; yet it requires very few arguments to convince a *landlord*, that in cold wet lands eſpecially, the leſs ploughed land you have, the leſs you put it in a *tenant's* power to ruin your eſtate. That a tenant of 60l. per annum in a dairy farm will get money, while a corn farm of the ſame ſize will ſtarve its occupier, (though perhaps the former gives 15s. per acre for his land, and the other but 10s.) is ſelf-evident;—not to mention, that not only the increaſed price of butter and cheeſe, but the difficulty in many pariſhes of getting even a pint of milk, an article ſo ſalutary and ſo neceſſary to ſubſiſtence in our early years, call aloud for every encouragement to be given to the pail.

The plough is a friend of every body's, though its advantages are very far from being particularly and locally felt; corn being an article that will bear keeping till the whim or caprice, or ſuppoſed advantage, of its poſſeſſor call it forth. But the produce of the cow is far otherwiſe. Cheeſe muſt neceſſarily be ſold at a certain period; it is a ponderous article, and one twelfth, or at leaſt fifteenth, of its value is often paid for carrying it to a fair fifty miles off; and the butter and ſkimmed milk find their way no great diſtance from home, varying as is evident by the price of butter frequently one-third in twenty or thirty miles. Every one muſt be ſenſible, that butter and cheeſe have riſen one third or more in price within twenty years. Is not this owing to the great encouragement given to the plough, and to grazing, at a time when (on account of the increaſed demand for milk, cream, butter, and cheeſe) every exertion on behalf of the dairy ſhould have been encouraged?

In Dorſetſhire the farmers take *all* the cream from their cheeſe, and yet think it equally delicious to the rich kinds made in Somerſetſhire, where it is thought high treaſon to take any. The difference at market may perhaps be five or ſix ſhillings; and yet I well know, that the butter thus ſtolen from the cheeſe is frequently equal to twelve ſhillings on every hundred weight of cheeſe. Suppoſe, then, the Society were to offer a premium for the beſt courſe of experiments upon the comparative value of butter and cheeſe.

1ſt. Butter from new milk alone.
2dly. Butter from half new milk and half whey.
3dly. Butter from whey alone.
4thly. Cheeſe from new milk.
5thly. Cheeſe from half-ſkimmed milk.
6thly. Cheeſe from all ſkimmed milk.

[*From Mr.* BILLINGSLEY, *Aſhwick.*]

In places where butter may be ſold throughout the year on an average at ſeven-pence or eight-pence per pound, I have found the moſt profitable method to be, that of making butter, and *half* ſkimmed cheeſe. In this way (on our land, which may be valued at from 20s. to 25s. per acre) ſix or ſeven pounds may be annually made from a good cow; allowing her the produce of two acres and a half for her ſummer and winter feed. The difference of price between this kind of cheeſe, and the beſt ſort, cannot be eſtimated at leſs than 8s. per hundred weight. This declaration may probably ſurpriſe, when compared with Mr. Davis's account of the Dorſetſhire method, where, he ſays, they "take all the "cream from the cheeſe, and yet the difference of price at "market is only 5 or 6 ſhillings per hundred weight."

Perhaps there cannot be a ſtronger proof of the inferiority of the plough, with reſpect to profit, than the ſuperior punctuality of the dairy farmer in the payment of his rent.—This obſervation, I believe, moſt ſtewards, who ſuperintend manors devoted partly to corn and partly to dairy farms, will verify; at leaſt, I have never met with one who controverts it.

But perhaps the advocate for the plough will ſay, that the generality of corn farmers are moſt egregious ſlovens;—that lands devoted to the plough are not confined to ſuch a mediocrity of profits as 20s. an acre;—that the produce of artificial graſſes (without which a well-managed arable farm cannot exiſt) far exceeds that of natural graſs, both in reſpect of quantity and nutrition;—that the ſtraw-yard is a moſt convenient place of reception for the cow when freed from the pail. Theſe and many other reaſons may be adduced, to ſhew the propriety of walking in the middle path, and of judiciouſly blending *arable* with *paſture*, in the proportion, perhaps, of *three* of the latter to *one* of the former.

Neceſsity of adapting the Crop to the Nature, Condition, and Circumſtances of the Land to be planted.

[*By Mr.* WIMPEY.]

THOUGH the lands of theſe kingdoms conſiſt of a very great variety, they may fitly enough be ranged under two general heads.——Firſt, all ſuch as naturally produce little of any value, either for man or beaſt; but require the art, labour, and attention of the huſbandman, to bring them into a ſtate of cultivation, ſo as to render them uſeful and profitable. Here the plough becomes a neceſſary inſtrument, in breaking up, dividing, and pulveriſing the ſoil; and hence ſuch lands are denominated *arable*.

Under the ſecond head may be placed all thoſe lands which ſpontaneouſly produce graſs and herbage proper for the feeding and fattening of cattle, the production of milk, of butter, and of cheeſe.

The occupier of the former is properly a corn-farmer; of the latter either a grazier or a dairyman; and it ſometimes happens, that all three functions are exerciſed in ſome degree by the ſame man, as may beſt ſuit the different parts of his farm.

From hence it follows, that occupiers of land, who purſue their buſineſs upon principles of reaſon and œconomy, have no choice, whether they will be corn-farmers, graziers, or dairymen. The occupiers of the former are *neceſſarily* corn-farmers; for without the plough and its auxiliary inſtruments, their fields would ſoon recur to their original wild ſtate, and be overrun with furze, briars, and brambles, and ſuch unprofitable productions as would be of no uſe or value. The occupier of the latter is as much bound by his intereſt to appropriate his lands to feeding or to the pail, as the other is by neceſſity to plant corn; for when nature has given herbage proper for ſuch purpoſes, the land is of much more value, and its profits to be acquired with far leſs labour and riſk, than from arable land.

It is admitted, that ſome land has been very imprudently broken up and converted to arable, which was of much more value to the occupier while it was in graſs; at the ſame time it cannot be denied, that ſome are as injuriouſly prejudiced againſt the plough, and will not conſent to have unfertile paſtures broken up, although they might be greatly improved thereby. I have now in my eye ſeveral fields not far from Warminſter, which would be worth double their preſent value to the occupier, if the owner would conſent to their being ploughed and planted with corn at proper intervals.

Upon the whole, I think, it may be fairly concluded, that for the loſs of every ton of herbage that has been ſuſtained by means of the plough, twenty, at leaſt, have been gained by the well-timed uſe of it. Moſt, almoſt the whole, of the improvements made in huſbandry in the courſe of the preſent century, have been by the prudent uſe of the plough. Turnips, clover, *all* the artificial graſſes, eſculent roots, herbs, and plants, ſo far as reſpects field culture and the feeding and fattening of cattle of every kind, have been obtained by its uſe ſolely, as none of them can be cultivated extenſively without it. Therefore, true as it is, that butter and cheeſe, and ſome other articles have advanced almoſt double their price in the laſt thirty and forty years; and true as it may be, that graziers and dairymen pay their rent more punctually than little corn-farmers, or the occupiers of ſmall arable farms; it can by no means be accounted for upon the principles of an undue and imprudent attachment to breaking up meadow and paſture land. What are the proper and genuine cauſes of theſe effects, we may endeavour to explain hereafter.

The writer of the article above-mentioned was exceedingly miſinformed reſpecting the comparative value of cheeſe made of milk which had been completely ſkimmed, and what had not been ſkimmed at all. The difference in price is at leaſt four times as much as the ſum he mentions. Skimmed cheeſe, I have been credibly informed, has been ſold at Warminſter fair, within about four years laſt, for 12s. 6d. per hundred; whereas the beſt rammill, ſay raw-milk, cheeſe, ſold for from 38s. to 42s. per hundred in the ſame fair, and prime cheeſe from the beſt dairies for 46s. or 48s. The medium prices of the three different kinds, that is to ſay, of ſkimmed, of half new and half ſkimmed, and of milk not ſkimmed at all, have been 15s. 28s. 40s. per hundred.

As to the beſt courſe of experiments reſpecting the comparative value of butter and cheeſe, Mr. Billingſley, in his very judicious remarks on the ſaid article, has given the true, and therefore the beſt general anſwer to the queſtion propoſed. For both produce and prices are ſo varied by local circumſtances, that, as he obſerves, " no ſettled invariable rules for the management of the dairy can with any propriety be eſtabliſhed." The quantity of produce of each article ſpecified may be eaſily aſcertained on any dairy; but the ſuperior advantage of any courſe can be determined only by the demands which ariſe or are promoted by peculiarities of ſituation.

It is aſſerted in the ſaid article, " That a tenant of 60l. per annum, in a dairy farm, will get money, while a corn-farm of the ſame ſize will ſtarve its occupier, (though perhaps the former gives 15s. per acre for his land, and the other but 10s.) is ſelf-evident." This is by no means a neceſſary truth ariſing from cauſes eſtabliſhed in the nature of the thing, but has its foundation in artifice, as will be ſhewn hereafter. However, this is not the intereſting queſtion. Is it ſelf-evident, or by any means demonſtrable, that a corn-farm of 10s. per acre, which would ſtarve its occupier, is by any method convertible into a dairy-farm; and that if the plough ſhould be abandoned, and ſuch land ſuffered to recur to its original and natural produce, as in that caſe it muſt do, would it not ſtarve the occupier, even if he gave but 5s. per acre for ſuch land?

It ſeems to have been totally forgotten, that the lands of *all* corn-farms, be they little or great, were originally paſture, and in that ſtate applicable *only* to grazing or the dairy; and many-hundred thouſand acres of ſuch land, worth only in that ſtate a ſhilling or two an acre, have been improved by means of the plough, to 10s. 15s. 20s. per acre, and ſome much more. Relinquiſh the plough, and thoſe very lands would by rapid degrees revert to their original ſtate of unproductiveneſs, and conſequently would be of no more value.

Many fields by proper culture would bear excellent crops of wheat, to which nature has denied herbage proper to fatten a rabbit. Individuals in certain ſituations may ſuffer by ill-judged converſion of land proper for grazing to arable; but I am of opinion, the practice is neither of ſuch extent or magnitude, as to advance the price of butter and cheeſe, even ſo much as a farthing a pound in the general market. Admitting then that the little corn-farmer of 50l. or 60l. per annum, with great labour and aſſiduity finds it difficult to live; while the dairy-farmer of the ſame rent not only carrieth on his buſineſs with incomparably more eaſe, but is getting money at the ſame time; alſo that butter and cheeſe are advanced at *leaſt* a third of their preſent price within theſe 20 or 30 years; I ſay, admitting theſe for facts, which I believe cannot be denied, we will proceed as briefly as we can to aſſign the true and genuine cauſes of the ſame.

It is a maxim generally allowed, that unleſs a farmer makes three rents he cannot live. A dairy-farmer, then, 20 years ago, whoſe rent was 60l. per annum, by this rule made 180l. per annum; ſo that having paid his rent, he had 120l. left; labour, expences, loſs of cattle, and incidental charges, having been uſually reckoned another third, the remaining 60l. was for the maintenance of himſelf and family. But if the produce of dairy-farms be advanced a full third of its preſent price, what ſold then for 60l. will now yield 90l. and conſequently the groſs amount, which was 180l. then, will be 270l. now; from which 60l. being deducted for rent leaves 210l. and from that ſum another 60l. as before for expences, &c. there remains then 150l. ſo that upon theſe principles the dairy-farmer has a net 90l. per annum, for his maintenance and profit more than he had 20 years ago. It can be no wonder, then, that he punctually pays his rent, and ſaves money. But it may be ſaid, and indeed very truly, that rents have been generally raiſed, eſpecially on little farms, nearly on the ſame proportion, and on ſome conſiderably more, and that ſo much muſt be deducted from the ſum above-mentioned. The remark is juſt, and the account being rectified accordingly, it will ſtand thus: inſtead of 60l. for rent, we muſt allow 90l. conſequently the additional 30l. is to be deducted from 150l. which reduces his net gain to 120l. which is juſt double what it was 20 years ago; and a very pretty income it is for a man of ſo ſmall a capital, and in ſo little buſineſs.—Let us next enquire how, on the ſame principles, matters ſtand with the corn-farmer, who is repreſented as being in a ſtarving and ruinous condition.

The corn-farmer is ſuppoſed alſo to occupy a farm of 60l. per annum; that he, like the former, makes three rents—one for his landlord, one for expences of all kinds, and the other for his maintenance, &c. But his expences will be far more conſiderable, as well as his labour and care, than the dairy-farmer's, and the ſurplus of theſe expences muſt come out of his ſhare. His farm has been equally raiſed with the former; therefore he now pays 90l. inſtead of 60l. he paid before; the additional 30l. being deducted from 60l. his ſhare, leaves only 30l. to maintain his family, and make good the extra expences of the ſecond ſhare. He has no reſource to an advantage in price in the produce of his farm like the former, to enable him to pay his advanced rent, which may be eaſily ſeen, by comparing the average prices of corn for the laſt 20 years, with thoſe of the 20 years immediately preceding, which I fear will be found to afford him little aſſiſtance.

If, then, it was with difficulty enough he made both ends meet before his rent was advanced, how is it poſſible he ſhould live now upon an income reduced one half, ſay from 60l. to 30l. or more probably from 40l. to 20l.? What is to be done then? To convert a farm that is properly arable to a dairy farm, is impracticable; and were it not, ſhould it be generally practiſed, it would entirely defeat its own purpoſe. The remedy, and the only remedy, ſeems to conſiſt in a reduction of the rents of ſuch farms, and the farmers adopting the modern improved culture, recommended by the very intelligent Mr. Billingſley, of "judiciouſly blending *arable* and *paſture*," but I think ſeldom "in the proportion of *three* of the latter to *one* of the former." If the farmer could get two good crops of artificial graſſes to two or three of corn, which I think would be more ſuitable to moſt lands, perhaps his crops of both would be more beneficial than on any other diviſion. But every one's mode of practice muſt be governed by the peculiar circumſtances of his farm.

But it may be aſked, if breaking up paſture lands, and converting them to tillage, is not the cauſe of the advance of price of butter and cheeſe, what is?— I anſwer, what would raiſe the price of any commodity whatever; it is foreſtalling, ingroſſing, and monopolizing. And perhaps there is no article in the large circle of commerce, that is ſo much the ſubject of thoſe pernicious arts, as butter and cheeſe.

The cheeſemongers in London, many of them at leaſt, are men of large capitals, who have correſpondents, agents, and factors, in many, I believe in moſt, of the conſiderable dairy counties in England. The prices of butter in large dairies are uſually fixed and agreed on at the beginning of the ſeaſon; and whether the year proves plentiful or otherwiſe, it makes no difference in the price. What is bought dear, will always be ſold dear, where there is no oppoſition or competitor in the market. I was once at Axminſter, when no bread and butter could be had with our tea; the reaſon being aſked, the miſtreſs of the inn aſſured us it frequently happened that an ounce of butter was not to be got in town, unleſs on a market-day, for all the great dairies were under contract with the London dealers for all they make, at a fixed price, which made it both ſcarce and dear. At the time ſhe ſaid this, there were 100 tubs of butter piled up in the gateway of the inn, in readineſs for the London waggons. Upon enquiry I found, the current price was 7s. 6d. per dozen wholeſale, and that the town and neighbourhood was ſupplied by ſuch little dairies only as were thought below the notice of the wholeſale dealers.

A ſimilar mode of practice is followed in regard to cheeſe. The great dealers in London long ſince inſtituted a club, and hold a weekly meeting to regulate their affairs. They employ agents or factors in Cheſhire and Lancaſhire, to buy up the cheeſe made in thoſe counties, which is done by agreement for whole dairies; they have ſeveral ſhips in their employ, which perform almoſt the whole carrying buſineſs between Liverpool and the metropolis. Not one of theſe ſhips is permitted to carry ſo much as a cheeſe for any one but the company. At their weekly meetings, they ſettle the quantity to be brought by each ſhip, which they proportion to the demand, being very careful that the town ſhall not be overſtocked, but kept rather hungry, as all the reſt of the dealers are ſupplied by them, as indeed is almoſt all England; for a good Cheſhire cheeſe is hardly to be got even in Cheſhire, as I have often heard from the maſters of thoſe veſſels, who are frequently employed to buy Cheſhire cheeſes in London, and carry them back again to gentlemen in thoſe counties, who can get none that is good at home. From hence it is eaſy to conceive, how much the price muſt be enhanced by two commiſſions, two freights, and the profit of at leaſt one commiſſioner, but very commonly of two.

It may be ſaid, this reſpects a county or two only; but it may as truly be ſaid, that a ſimilar practice obtains almoſt through every dairy county in the kingdom. Jobbers have eſtabliſhed themſelves almoſt every where, who either buy all they can immediately from the dairies, or conſtantly attend the markets and fairs in the neighbourhood of the dairies, and ingroſs large quantities, which infallibly advances the price of the whole immoderately. For inſtance, in Wiltſhire, the jobbers, 20 miles and upwards round Marlborough, conſtantly attend that market, where they buy up and contract for very large quantities of cheeſe for the enſuing fairs; that is to ſay, for Newbury, Andover, Weyhill, and Reading: from whence, if they are not offered a price to their minds, it is ſent by water to London, which is a market that infallibly takes off every thing But here it is got to the end of its journey, and muſt be ſold for whatever it will yield; and this is the reaſon why not only cheeſe, but all ſorts of grain, &c. are uſually ſold below the average price which generally obtains throughout England; often indeed conſiderably under what they yield in the place where they grew, or were manufactured.

Some 30 years ſince, it was uſual for cheeſe to be ſent immediately from the dairy to the fair in ſurpriſing quantities, and the price was then determined by the proportion the quantity bore to the demand. The bleſſings of propitious ſeaſons were then enjoyed in common, and the conſumer came in for his proportion; but now this natural and regular courſe is almoſt totally perverted by the jobber, and the price is no longer governed by the above proportion, but by the price it coſts the jobber, and the profit he thinks fit to put upon it. He is not obliged to comply with the current price, like the dairy-man, who had no other reſource; the buyer muſt conform to his price, or he will try it again and again at other fairs, till he ſucceeds, or in caſe of a diſappointment, at laſt it is ſent to the never-failing market—*London.*

Notwithſtanding the prolixity of this paper, I find myſelf under a ſtrong temptation to add a few lines in behalf of the little, and too often much diſtreſſed, farmer. If the occupations of men were to be eſtimated by the ſervice they render the public, and the pitiful recompence ſome have in compariſon with others, I believe it would be extremely difficult to find any claſs of men who are ſo richly entitled to favour and encouragement as the little corn-farmer. His toil and anxiety are inceſſant; his labour, from the riſing of the ſun to the going down of the ſame, and often much longer; his diet the pooreſt; his clothing, lodging, and other accommodations, as mean and comfortleſs as can well be conceived. Theſe are all the recompence he has in general, for his indefatigable and unremitted labour in providing the neceſſaries of life for the reſt of the community; for to the little and middle farmer are we chiefly indebted for the well-timed ſupplies of thoſe things, without which we could not ſubſiſt. It is the little and middle farmers, who ſupply the market from harveſt to Chriſtmas and onwards. They muſt raiſe money to pay ſervants' wages, tradeſmen's bills, taxes, rent, &c. &c. The "whim or caprice, or ſuppoſed advantages," which are aſcribed to corn farmers in general, are applicable only to the great and opulent, who are able to monopolize as well as cultivate: and ſome, through an avaricious ſpirit, would withhold from market, till corn, &c. advanced to a price that would ſtarve the reſt of the people. I therefore repeat it, the little farmer whether he be a corn or a dairy farmer, provided he prudently appropriates his land to the production of the moſt beneficial crops, cannot

eive too much countenance and encouragement from the
blic, not only to whoſe convenience, but ſubſiſtence and
ll-being, he devotes a ſlaviſh and moſt laborious life.

I have already obſerved, that the diſtreſſes of the little
n-farmer are in part owing to the great advance of his
it; but whenever, in the viciſſitude of human affairs, the
ces of grain ſhall fall to that low price which a ſeries of
itful years hath ſometimes produced, as for example, be-
een 1730 and 1750, rents will tumble faſt indeed, but un-
tunately the poor farmer muſt tumble firſt. Corn being
e at the low price it ſold at then, no device or artifice
atever could keep up rents to the pitch they have attained
reſent. No routine of crops yet propoſed, though made
h the greateſt judgment, would enable the little farmer to
d his ground, and ſatisfy his landlord.

But though ſo large an advance of rent is one, it is not
only reaſon of the little farmer's difficulties. It is ge-
ally allowed, that to do well, a farmer's capital muſt be
aſt equal to three times his rent; but I am well ſatiſ-
, if it were equal to five rents, it would be vaſtly better
h for himſelf and his landlord. What a miſerable chance
n muſt both run, when the farmer is ſcarcely poſſeſſed of
k equal to a ſingle year's rent, which I am afraid is too
uently the caſe.

As experiments to determine the comparative value of
ter and cheeſe have been thought of ſome importance, I
e the liberty of preſenting one to the Society. It is on
nall ſcale, but made with great care and exactneſs.—
e hundred and five gallons and a half of milk were
perly diſpoſed in pans for ſkimming off the cream. It
duced 36 pounds of butter, and 60 pounds of ſkimmed
eſe. The low average of good butter, in this neighbour-
d, is 8½d. per pound. And the ſkimmed cheeſe was ſold

for 2d. per pound. I am informed this ſort of cheeſe, three or at moſt four years ſince, ſold only for a penny farthing, or at moſt three half-pence per lb.

	£	s.	d.
36lb. of butter at 8½d.	1	5	6
60 lb. ſkimmed cheeſe at 2d.	0	10	0
Total - - -	1	15	6

Of a like quantity of milk, ſay one hundred and five gallons and half, were made 106lb. of raw-milk cheeſe, and 6lb. of whey and butter. The cheeſe at two months old was worth at leaſt 3½d. per pound, and the whey butter ſold at 7d. per pound.

	£	s.	d.
106lb. raw-milk cheeſe, at 3½d.	1	10	11
6lb. whey butter for 7d.	0	3	6
Total - - -	1	14	5

From this experiment it appears, that when the butter and cheeſe, of each ſort above-mentioned, will ſell for the above prices, a ſmall advantage lies on the ſide of butter and ſkimmed cheeſe. It amounts to 13d. only in 1l. 15s. 6d. which is about three per cent.

Butter from half new milk and half whey would be of a middle quality between the other two, and the coſt price of courſe muſt be ſo too; and ſo muſt cheeſe from half-ſkimmed milk; but each of theſe may be varied in goodneſs according to the proportion of milk and whey, and of the milk ſkimmed and unſkimmed; ſo that the price of the latter may be varied from 20s. to 30s. per hundred. But the advantage of following either courſe depends upon local circumſtances, as was obſerved before; and the dairy man, to acquire the greateſt profit, muſt regulate his mode of practice according thereto..—*Dec. 6th*, 1786.

[*By Mr.* WIMPEY, *Nov.* 26, 1786.]

It is generally thought, and on very good grounds, that all arable farms do not afford the occupier ſo good a iintenance as dairy farms of the ſame annual value.

A farm, therefore, which conſiſts wholly, or almoſt ſo, of ıd that is properly arable, muſt ever continue arable; for it not practicable to render it in any degree fertile, but by ;ans of the plough; or to keep it long ſo even when it is ıde ſo. But though arable land cannot be converted in- meadow or paſture proper for a dairy, it may be planted th articles which, it is well known now, will anſwer the rpoſe of feeding horned cattle, eſpecially milch-cows, as ectually as good meadow or paſture, producing as much lk, and altogether as rich, as ſweet, and as good.

But the great intereſting queſtion is, whether thoſe articles ıich can be procured only by the heavy expences of plough- ;, harrowing, ſeed, and other operations which neceſſarily end their culture and harveſting, will afford as much ſuſte- nce in proportion to the expence as meadow or paſture ıich is liable to little or none, excepting what is made into y, the cattle gathering it for themſelves as they conſume it.

We are aſſured, by unqueſtionable authority, that a buſhel potatoes, given half at night and half in the morning, th a ſmall allowance of hay, is ſufficient to keep three cows day. On that allowance their milk will be as rich and as od, and the quantity as great, as in the ſummer months ıen the cows are in good paſture.

An acre of land, properly cultivated with potatoes, will oduce 337 buſhels, and the total expence of cultivating an re is eſtimated at 6l. 13s. 7½d. If three cows eat ſeven ıſhels per week, then they would eat 365 buſhels in a ar; and twenty cows would conſume 2433 buſhels. The ıeſtion then is, if twenty cows require 2433 buſhels [illegible] them a year, and as above an acre of land properly cultivated will produce 337 buſhels nett, how many acres will be required to produce 2433 buſhels, or the quantity neceſſary to feed twenty cows to keep them in full milk the year round? The anſwer is, ſeven acres and a quarter nearly.

It may be ſaid, this calculation reſpects potatoes only; how will this mode of culture anſwer when applied to the growth of other articles of food uſed as a ſuccedaneum to herbage? Let us try.

By an experiment made on a pretty large ſcale lately by Mr. VAGG, it ſeems to appear, that cabbage on arable land is much about as ſuperior to natural paſture as potatoes.

Turnips, turnip-rooted cabbage, carrots, parſnips, and ſome other articles, by many experiments often repeated, have been found adequate to the ſame valuable purpoſes, at leaſt ſo far as to be more lucrative than meadow or paſture. I omit clover and rye-graſs, becauſe they have been long in general practice; but are in common very ſhort of the advantages which may be derived from the cultivation of the other articles recommended.

There is one other article, however, which is particularly worthy of the arable farmer's utmoſt care and attention, which he may rely on with great confidence, if he will be at the pains of thoroughly cleaning his land, and of keeping it ſo for two or three years after it is planted. The article [illegible] mean is Sainfoin.——Small arable farms, which in a manner are quite deſtitute of herbage, cannot well be ſupplied with any ſubſtitute that is by any means its equal. Indeed one acre of good ſainfoin is of more value than two acres of middling meadow or paſture. And as it will thrive ſo well on a very poor ſoil, the arable farmer, who either keeps no cows for want of herbage, or keeping them is pinched for food for them, is perfectly ignorant of the advantages atding the culture of this plant, or miſerably indolent and xcuſable in not better attending to his intereſt.

Whatever crop precedes the planting ſainfoin, the ground ould be ploughed in the winter, and laid up in ſharp deep lges by one bout of the plough, to continue to the beginng of April. Then it ſhould be dragged and harrowed vel: and if the land be very poor, it ſhould have ſome ht dreſſing of aſhes, ſoot, or compoſt of lime, earth, and tten dung, well incorporated together. A ſmall quantity either of theſe would greatly encourage the plants in their fant ſtate. The beginning or middle of April, as the ſean may prove, the ſeed ſhould be ſown, and there would be tle danger of its ſucceeding to one's wiſh.

Beſides the above, perhaps there are very few articles in uſe ſubſtitutes for paſture, that are equally profitable with carts and parſnips, when the ſoil is ſuitable to their manner of owth and culture. The ſoil they delight and flouriſh moſt is a deep, light, free ſoil, which is eaſily penetrated, and oderately fertile. In ſuch a ſoil (if properly hoed, and ſet t at due diſtances) they will arrive at a great magnitude, d the acreable produce be very ſurpriſing. Another adntage is, their being ſo very acceptable to the farmer's ck of every kind; horſes, cows, ſheep, and hogs, eat them emingly with the ſame appetite, and are equally improved y them. Upon the whole of this account, it ſeems clearly follow, that an arable farm of 50l. or 60l. per annum, ough it has not an acre of meadow or paſture land belongg to it, may by ſkill and proper management be made to roduce as much and as good butter and cheeſe as a dairyrm of the ſame value, and have a large proportion of land ft for the growth of corn and other purpoſes.

Management of the Dairy, particularly with reſpect to making Butter.

[*By* J. Anderson, LL.D. F. R. S.]

THE ſmall Alderney cows afford the richeſt milk hitherto known; but individual cows in every country may be found, by a careful ſelection, that afford much thicker milk than others; theſe, therefore, ought to be ſearched for with care, and their breed reared with attention, as being peculiarly valuable.—— To make the cows give abundance of milk, and of a good quality, they muſt at all times have plenty of food. Graſs is the beſt food yet known for this purpoſe, and that kind of graſs which ſprings up ſpontaneouſly on rich dry ſoils is the beſt of all. If the temperature of the climate be ſuch as to permit the cows to graze at eaſe throughout the day, they ſhould be ſuffered to range on ſuch paſtures at freedom; but if the cows are ſo much incommoded by the heat as to be prevented from eating through the day, they ought in that caſe to be taken into cool ſhades for protection, where, after allowing them a proper time to ruminate, they ſhould be ſupplied with abundance of green food freſh cut for the purpoſe, and given to them by hand frequently in ſmall quantities freſh and freſh, ſo as to induce them to eat it with pleaſure. When the heat of the day is over, and they can remain abroad with eaſe, they may be again turned into the paſture, and ſhould be allowed to range with freedom all night during the mild weather of ſummer.

Cows, if abundantly fed, ſhould be milked three times a day during the whole of the ſummer ſeaſon; in the morning early, at noon, and in the evening, juſt before night-fall. In the choice of perſons for milking the cows, great caution ſhould be employed; for if that operation be not carefully and properly performed, not only the quantity of the produce of the dairy will be greatly diminiſhed, but its quality alſo will be very much debaſed; for if all the milk be not thoroughly drawn from a cow when ſhe is milked, that portion of milk which is left in the udder ſeems to be gradually abſorbed into the ſyſtem, and nature generates no more than to ſupply the waſte of what has been taken away. If this leſſened quantity be not again thoroughly drawn off, it occaſions a yet farther diminution of the quantity of milk generated; and ſo on it may be made to proceed in perpetual progreſſion from little to leſs, till none at all is produced.

Few perſons are ignorant, that milk which is taken from the cow laſt of all at milking (which in this country is called *ſtroakings*) is richer than the reſt of the milk—but fewer ſtill are aware of the greatneſs of the diſproportion between the quality of the firſt and laſt drawn milk from the ſame cow at one milking. The following facts reſpecting this circumſtance were aſcertained by me many years ago, and have been confirmed by many ſubſequent experiments and obſervations. Having taken ſeveral large tea-cups exactly of the ſame ſize and ſhape, one of theſe tea-cups was filled at the beginning of the cow milking, and the others at regular intervals till the laſt, which was filled with the dregs of the ſtroakings. Theſe were each weighed, the weight of each cup being ſettled ſo as to aſcertain that the quantity of milk in each was preciſely the ſame; and from a great number of experiments, frequently repeated with many different cows, the reſult was in all caſes thus:——The quantity of cream obtained from the firſt-drawn cup was, *in every caſe*, much ſmaller than from that which was laſt drawn; and thoſe between afforded leſs or more, as they were nearer the beginning o[illegible] It is unneceſſary here to ſpecify theſe interme but it is proper the reader ſhould be informed, that the quantity of cream obtained from the laſt-drawn cup, from ſome cows, exceeded that from the firſt in the proportion of *ſixteen* to *one*. In other cows, however, and in particular circumſtances, the diſproportion was not quite ſo great; but in no caſe did I find it fall ſhort of the rate of *eight* to *one*. Probably, upon an average of a great many cows, it might be found to run as *ten* or *twelve* to *one*.—2*dly*. The difference in the *quality* of the cream, however, obtained from theſe two cups, was much greater than the difference in the *quantity*. In the firſt cup the cream was a thin tough film, thinner and whiter than writing-paper; in the laſt, the cream was of a thick *butyrous* conſiſtence, and of a glowing richneſs of colour, that no other kind of cream is ever found to poſſeſs.—3*dly*. The difference in the quality of the *milk* that remained after the cream was ſeparated, was perhaps ſtill greater than either in reſpect to the quantity or the quality of the cream. The milk in the firſt cup was a thin bluiſh liquid, like as if a very large proportion of water had been mixed with ordinary milk; that in the laſt cup was of a thick conſiſtence and yellow colour, more reſembling cream than milk, both in taſte and appearance.

From this important experiment it appears, that the perſon who, by bad milking of his cows, loſes but half a pint of his milk, loſes in fact about as much cream as would be afforded by ſix or eight pints at the beginning, and loſes beſides that part of the cream which alone can give richneſs and high flavour to his butter.

If milk be put up in a diſh, and allowed to ſtand till it throws up cream, that portion of cream which riſes firſt to the ſurface is richer in quality, and greater in quantity, than what riſes in a ſecond equal portion of time; and the cream that riſes in the ſecond interval of time is greater in quantity and richer in quality than that which riſes in a third equal ſpace of time; and that of the third than the fourth, and ſo on, the cream that riſes decreaſes in quantity and declines in quality, continually, as long as any riſes to the ſurface.

Thick milk always throws up leſs cream to the ſurface than milk that is thinner, but that cream is of a richer quality; and if water be added to that thick milk, it will afford a conſiderably greater quantity of cream than it would have done if allowed to remain pure; but its quality is at the ſame time greatly debaſed.

Milk which is put into a bucket or other proper veſſel, and carried in it to any conſiderable diſtance, ſo as to be much agitated and in part cooled before it be put in the milk-pans to ſettle for cream, never throws up ſo much nor ſo rich cream, as if the ſame milk had been put into the milk-pans directly after it was milked.

It is of importance that the cows ſhould be always milked as near the dairy as poſſible, to prevent the neceſſity of carrying and cooling the milk before it be put in the diſhes; and as cows are much hurt by far-driving, it muſt be a great advantage in a dairy farm to have the principal graſs-fields as near the dairy as poſſible.——The practice of putting the milk of all the cows of a large dairy into one veſſel, as it is milked, there to remain till the whole milking be finiſhed before any part of it is put into the milk-pans, ſeems to be highly injudicious; not only on account of the loſs that is ſuſtained by agitation and cooling, but alſo more eſpecially becauſe it prevents the owner of the dairy from diſtinguiſhing the good from the bad cow's milk, ſo as to ſeparate theſe from each other, where it is neceſſary. He may thus have the whole of his dairy product greatly debaſed by the milk of one bad cow, for years together, without being able to diſcover it.* A better practice would be, to have the milk drawn from each cow ſeparately put into the creaming-pans as ſoon as it is milked, without being ever mixed with any other. Thus would the careful dairy-man be able on all occaſions to obſerve the particular quality of each individual cow's milk, as well as its quantity, and to know with preciſion which of his cows it was his intereſt to diſpoſe of, and which of them he ought to keep and breed from.

If it be intended to make butter *of a very fine quality*, it will be adviſeable in all caſes to keep the milk that is firſt drawn ſeparate from that which comes laſt. In the Highlands of Scotland they have adopted (without thinking of the improvement of their butter) a very ſimple and œconomical practice in this reſpect. As the rearing of calves is there a principal object with the farmer, every cow is allowed to ſuckle her own calf with a portion of her milk, the remainder only being employed in the dairy. To give the calf its proportion regularly, it is ſeparated from the cow, and kept in an incloſure along with all the other calves belonging to the ſame farm. At regular times the cows are driven to the door of the calves' incloſure, where the young ones fail not to meet them. Each calf is then ſeparately let out, and runs directly to its mother, where it ſucks till the dairy-maid judges it has had enough, when ſhe orders it to be driven away, having previouſly ſhackled the hinder legs of the mother, by a very ſimple contrivance, to oblige her to

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[*] I once ſaw a cow that gave milk which could never be made to yield any butter at all, though it had the appearance of being very rich milk. The perſon who ſold that cow had had her ſeveral years, along with many others, without having any ſuſpicion of this peculiarity. It was only diſcovered when ſhe came into the poſſeſſion of a perſon who had but one cow.

ſtand ſtill. Boys drive away the calf with ſwitches, and return it to the incloſure, while the dairy-maid milks off what was left by the calf. Thus they proceed till the whole of the cows are milked, and thus do they obtain a ſmall quantity of milk, it is true, but that milk of an exceeding rich quality: which, in the hands of ſuch of the inhabitants as know how to manage it, is manufactured into the richeſt marrowy butter that can be any where met with. This richneſs of the Highland butter is univerſally aſcribed to the old graſs the cows feed upon in their remote glens, but it is in fact chiefly to be attributed to the practice here deſcribed, which has long prevailed in theſe regions.

I ſhall here mention one mode of managing milk, by means of which the inferior kinds of it might, on many occaſions, eſpecially within reach of towns, be diſpoſed of to great advantage. Take common ſkimmed milk when it has begun to turn ſour, put it into an upright ſtand churn, or a barrel with one of its ends out, or any other convenient veſſel. Heat ſome water, and pour it into a tub that is large enough to contain with eaſe the veſſel in which the milk was put. Set the veſſel containing the milk into the hot water, and let it remain there for the ſpace of one night. In the morning it will be found that the milk hath ſeparated into two parts, a thick cream-like ſubſtance which occupies the upper part of the veſſel, and a thin ſerous watery part, that remains in the bottom; draw off the thin part by opening a ſtop-cock placed for that purpoſe cloſe above the bottom, and reſerve the cream for uſe. Not much leſs than the half of the milk is thus converted into a ſort of cream, which, when well made, ſeems to be as rich and fat as real cream itſelf, and is only diſtinguiſhable from that by its ſourneſs. It is eaten with ſugar, and eſteemed a great delicacy, and uſually ſells at double the price of freſh unſkimmed milk. It requires practice, however, to be able to make this nicely; the degee of heat of the water, and many other circumſtances, greatly affecting the operation. Theſe things practice beſt diſcovers.

If the *quality* of the butter be the chief object attended to, it will be neceſſary not only to ſeparate the firſt from the laſt drawn milk, but alſo take nothing but the cream that is firſt ſeparated from the beſt milk, as it is this firſt riſing cream alone that is of the prime quality. The remainder of the milk, which will be ſtill ſweet, may be either employed for the purpoſe of making ſweet milk cheeſes, or it may be allowed to ſtand to throw up cream for making butter of an inferior quality, as circumſtances may direct.

Butter of the very beſt poſſible quality can only be obtained from a dairy of conſiderable extent, when judiciouſly managed; for when only a very ſmall portion of each cow's milk can be ſet apart for throwing up cream, and when only a very ſmall proportion of that cream can be reſerved as of the prime quality, it follows, that, unleſs the quantity of milk were upon the whole very conſiderable, the quantity of prime cream produced would be ſo ſmall as to be ſcarcely worth the while for manufacturing ſeparately.

Thus it ſeems probable, that the very beſt butter could only be with œconomy made in thoſe dairies where the manufacture of cheeſe is the principal object. The reaſons are obvious: If only a ſmall portion of the milk ſhould be ſet apart for butter, all the reſt may be made into cheeſe while it is yet warm from the cow and perfectly ſweet; and if only that portion of cream which riſes during the firſt three or four hours after milking is to be reſerved for butter, the rich milk which is left after that cream is ſeparated, being ſtill perfectly ſweet, may be converted into cheeſe with as great advantage nearly as the newly milked milk itſelf.

No dairy can be managed with profit, unleſs a place properly adapted for keeping the milk, and for carrying on the different operations of the dairy, be firſt provided. The neceſſary requiſites of a good milk-houſe are, that it be cool in ſummer, and warm in winter, ſo as to preſerve a temperature nearly the ſame throughout the whole year; and that it be dry, ſo as to admit of being kept clean and ſweet at all times. As it is on moſt occaſions difficult to contrive a place within the dwelling-houſe that can poſſeſs all theſe requiſites, I would adviſe that a ſeparate building ſhould be always erected, which, upon the plan I ſhall now deſcribe, may in every ſituation be reared at a very ſmall expence.

This ſtructure ought, if poſſible, to be erected near to a cool ſpring, or running water, where eaſy acceſs can be had to it by the cows, and where it is not liable to be incommoded by ſtagnant water. It ſhould conſiſt of a range of narrow buildings as in the plan;* that diviſion in the middle, marked A, being the milk-houſe properly ſo called. The walls of this building ſhould be reared of brick, or of ſtone and lime, all round the inſide; this wall need not exceed in thickneſs one brick in length, or if of ſtone, about one foot thick; beyond that, the wall (which is full ſix feet in thickneſs) ſhould be made of ſod on the outſide, and earth rammed firm within that. The inſide wall of this building may be ſeven or eight feet high in the ſides, on which may be placed the couples to ſupport the roof, and the walls at the gabels carried up to the height of the couples. Upon theſe ſhould be laid a roof of reeds, or thatch, that ſhould not be leſs than three feet in thickneſs, which ſhould be produced downward till it covers the whole of the walls on each ſide;

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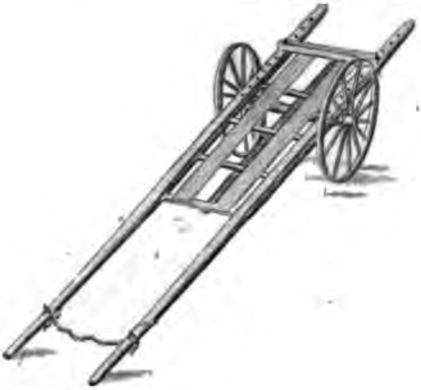
* See the plate annexed.

but here, if thatch or reeds be not in ſuch plenty as could be wiſhed, there is no occaſion for laying it on quite ſo thick In the roof, exactly above the middle of the building, ſhould be placed a wooden pipe of a ſufficient length to riſe a foot or two above the roof, to ſerve occaſionally as a ventilator. The top of this funnel ſhould be covered, to prevent rain from getting through it, and a valve fitted to it, that by means of a ſtring could be opened or ſhut at pleaſure. A window alſo ſhould be made upon one ſide for giving light, the ſtructure of which will be beſt underſtood from the ſection of this part of the building, which is repreſented at fig. 2. F. G. It is neceſſary to ſpecify, however, that this aperture ſhould be cloſed by means of two glazed frames, one on the outſide at G; and the other on the inſide at F. I preſume it is hardly neceſſary to inform the reader, that the uſe of this double ſaſh, as well as the great thickneſs of the wall, and of the thatch upon the roof, as alſo of the buildings at the end of it, are to render the temperature of this apartment as equal as poſſible at all ſeaſons of the year, by effectually cutting it off from having any direct communication with the external air.——The apartment marked B, is intended to ſerve as a repoſitory for the utenſils of the dairy, and a place in which they may be cleaned, and put in order, to be ready when they are wanted. For this purpoſe ranges of ſhelves may be placed all round the walls, and tables and other conveniences placed where neceſſary. Here the walls are thinner than the other, and may be built wholly of brick or ſtone; nor is there a neceſſity for having the thatch here ſo thick laid on as in the middle diviſion. In one corner at H, is placed a cauldron of a convenient ſize proportioned to the dairy, for warming water to ſcald the veſſels, over a cloſe furnace, the flue of which terminates in a chimney carried ſlanting over the door in the gabel, above which it riſes up-

Plate.I.

A Leith Cart.



Plan

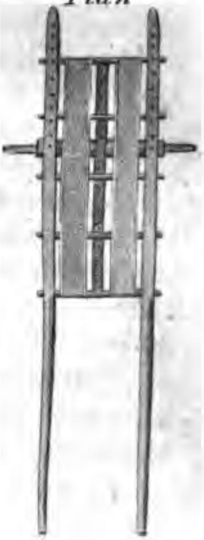
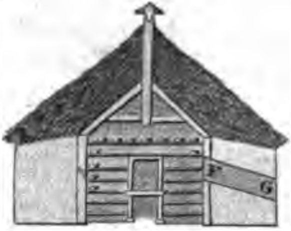


Fig. 2. *Section of a Milk House through the line,* a. b.



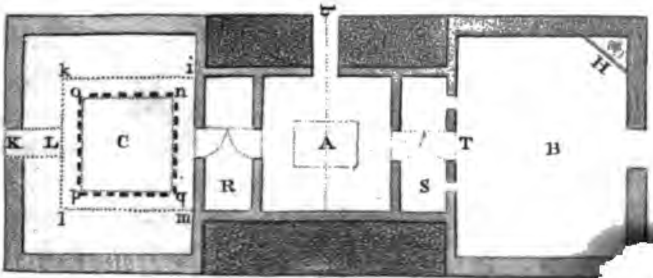


Fig.I. *Plan of a Milk-house with its neceſsary appurtena*

[illegible]

and there emits the ſmoke.——The other apartment,
ay be employed as a kind of ſtore-room, in which the
butter, and other products of the dairy, and ſpare
ls, may be locked up, till it becomes convenient to re-
them elſewhere.——The ſmaller apartments, R and
merely cavities formed in the thickneſs of the partition
hat may be employed for any uſe that ſhall be found
nient; the double doors on theſe paſſages being in-
l to cut off more effectually all communication between
ternal air and the milk-houſe, when either the great
or great cold of that may render it neceſſary. The
above theſe ſmall apartments ought to come one foot
within than in the milk-houſe, the more effectually
all communication of air from the outer apartments,
place where the couples are placed. When the air is
ate, the door at T may in general be left open to fa-
the entry to and from the milk-houſe on ordinary
ns. All the doors open as marked by the dotted lines.
ough each of theſe doors, as well as the outer doors
apartments B and C, ought to be made an aperture
ut a foot ſquare, having a ſmall door exactly fitted to
can be opened and ſhut at pleaſure. Over the in-
each of theſe apertures ſhould be ſtretched a piece of
uze covered with a fine netting of wire; ſo that when
was temperate, and the wind blowing in a proper
on, by opening theſe little doors, a draught of air
be carried through the whole of theſe buildings that
keep them ſweet and dry, without admitting flies or
vermin.——The whole of theſe apartments ſhould be
plaſtered with lime on the inſide of the walls and
. The apartment A at leaſt ſhould alſo be paved with
nes, that ſhould be raiſed ſix inches higher than the
of the ground without, having ſlanting gutters to

convey water or any other liquid that might be accidentally ſpilt. The walls all round ſhould be lined with ſhelves of a convenient breadth, in ranges one above the other, on which the diſhes may be placed; and in the middle ſhould ſtand a large table, marked by the dotted lines on the plan, which if made of ſtone will be found to be more cleanly and convenient than any other material. Beneath it a piece of the pavement about a foot in breadth, ſhould be raiſed ſix inches higher all round than the level of the floor, ſo as to form a trough within it for holding water, the uſes of which will be afterwards ſpecified. This baſon may be emptied entirely at pleaſure, by opening a hole that allows the water to run into the common gutters.

The next object that demands attention is, the utenſils of the dairy. Theſe in general muſt, from the nature of the buſineſs, be made of wood. But of late many perſons, who affect a ſuperior degree of elegance and neatneſs, have employed veſſels made of lead, or of common earthen-ware, for various purpoſes in the dairy. But as the acid of milk very readily diſſolves lead, braſs, or copper, and with theſe forms a compound of a poiſonous nature; ſuch veſſels muſt be accounted highly pernicious in the dairy, and therefore ought to be baniſhed from it. The ſame may be ſaid of veſſels of any of the common kinds of earthern ware, which being glazed with lead, and the glazing ſoluble in acid, are equally improper; excepting veſſels of true porcelain, or glaſs, which are greatly too expenſive, I know of none that could be with propriety ſubſtituted for wooden veſſels in the dairy.

The length of time that ſhould elapſe before the cream be ſeparated, will depend upon the degree of heat at the time, and the particular views of the owner of the dairy. In a moderately warm temperature of the air, if very fine butter be intended, it ſhould not ſtand more than ſix or eight hours;

any perſons who have had little experience in the dairy
ve, that no butter can be of the fineſt quality, except
which has been made from cream that has not been kept
e one day; but this is a very great miſtake. So far in-
is this opinion from being well founded, that it is in
few caſes that even tolerably good butter can be obtained
ı cream that is not more than one day old. The ſepa-
n of butter from cream only takes place after the cream
ıttained a certain degree of acidity.

'he butter when made muſt be immediately ſeparated
ı the milk, and being put into a clean diſh, (the moſt
venient ſhape is that of a ſhallow bowl) the inſide of
:h, if of wood, ſhould be well rubbed with common ſalt,
revent the butter from adhering to it; the butter ſhould
reſſed and worked with a flat wooden ladle, or ſkimming
, having a ſhort handle, ſo as to force out all the milk
was lodged in the cavities of the maſs.

ome perſons employ cold water in this operation, which
pour upon the butter, and thus, as they ſay, waſh it;
this practice is not only uſeleſs, as the butter can be per-
ly cleared of the milk without it, but alſo pernicious,
uſe the quality of the butter is thus debaſed in an aſto-
ing degree.

n every part of the foregoing proceſs it is of the utmoſt
ortance that the veſſels, and every thing elſe about the
y, be kept perfectly clean and ſweet, for without this pre-
tion there neither can be pleaſure nor profit derived from it.

Vooden veſſels are, upon the whole, moſt proper to be
loyed for containing ſalted butter. Theſe ſhould be
le of cooper work, very firm, and tightly joined with
ng *wooden* hoops. It will be adviſeable to make them
y ſtrong where circumſtances permit them to be returned
he dairy; for as it is a matter of conſiderable difficulty

to ſeaſon new veſſels ſo well as that they ſhall not affect the taſte of the butter, it is always adviſeable to employ the old veſſels rather than make new ones, as long as they continue firm and ſound. Oak is the beſt wood for the bottom, and ſtaves and broad Dutch ſplit hoops are to be preferred to all others, where they can be had. Iron hoops ſhould be rejected, as the ruſt from them will in time ſink through the wood, tho' it be very thick, and injure the colour of the butter.

Common ſalt is almoſt the only ſubſtance that has been hitherto employed for the purpoſe of preſerving butter; but I have found, by experience, that the following compoſition is, in many reſpects, preferable to it, as it not only preſerves the butter more effectually from any taint of rancidity, but makes it alſo look better, and taſte ſweeter, richer, and more marrowy, than if the ſame butter had been cured with common ſalt alone. I have frequently made comparative trials with the ſame butter, and always found the difference much greater than it could be well conceived. The compoſition is as follows:—Take of ſugar one part, of nitre one part, and of the Spaniſh great ſalt, (or of Doctor Swediaur's beſt ſalt,* which is ſtill better than the former, being cleaner) two parts. Beat the whole into a fine powder, mix them well together, and put them by for uſe.

Of this compoſition one ounce ſhould be put to every ſixteen ounces of butter; mix this ſalt thoroughly with the butter as ſoon as it as been freed from the milk, and put it without loſs of time down into the veſſel prepared to receive it, preſſing it ſo cloſe as to leave no air-holes, or any kind of cavities within it. Smooth the ſurface, and if you expect that it will be above a day or two before you can nore, cover it cloſe up with a piece of clean linen, and that a piece of wetted parchment, or for want of that nen that has been dipped in melted butter, that is exfitted to the edges of the veſſel all round, ſo as to ex- the air as much as poſſible, without the aſſiſtance of ratery brine; when more butter is to be added, theſe ings are to be taken off, and the butter applied cloſe the former, preſſing it down and ſmoothing it as beand ſo on till the veſſel be full. When it is quite full, e two covers be ſpread over it with the greateſt care, and little melted butter be poured all round the edges, ſo as up every cranny, and effectually exclude the air. A alt may be then ſtrewed over the whole, and the cover nly fixed down to remain cloſe ſhut till it be opened e. If all this be carefully done, the butter may be kept tly ſound in this climate for many years. How many I cannot tell; but I have ſeen it two years old, and in reſpect as good as when it was only a month old.

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* Manufactures at Preſtonpans, near Edinburgh.

t after this butter has been cured in the moſt perfect er, it may chance to be much debaſed in its quality, by improperly treated during the time it is uſing. Thereobſerve, that when it is broken up for uſe, a ſmall n ſhould be pared from the ſurface all over, eſpecially the edges, in caſe the air ſhould not have been ſo enexcluded as it ought to have been. If it be to be ly conſumed, it may be then ſpooned up as it is wanted, ut any other precaution than that of keeping it carefully d up ſo as to exclude duſt, &c. from having acceſs to ut if it be to be uſed very ſlowly, and if the perſon emd in ſpooning it up be not very careful, or ſo indos not to be at the trouble of cloſing it up at each time the covers, it may happen that the part which is thus xpoſed to the air may contract a ſmall degree of rancidity. To guard againſt this evil, in theſe circumſtances, when the veſſel is opened, let a ſtrong brine of common ſalt be prepared that will ſwim an egg, and poured, when cold, upon the ſurface of the butter; this will cover that ſurface effectually, even though the operator ſhould be a little careleſs, and will thus guard againſt the inconvenience complained of: for though the quality of the butter will thus be injured in ſome degree, in conſequence of the water acting upon it, yet that is an evil of far leſs material moment than the ſlighteſt degree of rancidity would occaſion.

Butter thus cured would bear to be carried to the Eaſt or to the Weſt-Indies, and would keep ſweet during the longeſt voyages, if it were ſo packed as not to allow the butter to be ſo far melted as to occaſion the ſalts to ſeparate from it. But as none of theſe ſalts admit of any chemical union with the butter, it muſt happen, that if ever the butter be ſo far melted as to become of a fluid conſiſtence, the ſalts drop to the bottom, and the butter, deprived of their antiſeptic powers, quickly becomes rancid.

This refined butrer may be preſerved in yet another way, which I have ſometimes ſeen practiſed here by way of medical *bonne bouche* (comfit.) After the butter is purified, add to it a certain proportion of firm honey, mix it well, it will incorporate thoroughly with the butter, and when cold it eats very pleaſantly ſpread on bread like butter; and may be given to old people, if they reliſh it, inſtead of marrow, and to others, as being uſeful for coughs and colds. Theſe were the uſes to which I have ſeen this ſubſtance applied, and on theſe occaſions the proportion of honey employed was conſiderable. I have ſeen it kept for years, without manifeſting the ſmalleſt tendency to rancidity; ſo that there can be no doubt but that butter might thus be preſerved in long voyages without ſpoiling. The only point that remains to be aſcertained is, what is the ſmalleſt proportion of honey that would be ſufficient to preſerve the butter. Sugar is known to be a much more powerful antiſeptic than common ſalt, and probably honey may be in that reſpect nearly on a par with ſugar; if ſo, it would be reaſonable to ſuppoſe that one ounce of honey might be ſufficient to preſerve ſixteen ounces of butter. In that caſe the taſte of the honey would not be extremely perceptible; ſo that the butter, even to thoſe who might not reliſh the ſweet compoſition above-mentioned, might prove very agreeable, eſpecially if a little ſalt were mixed with it when about to be uſed. A few experiments would be ſufficient to aſcertain this particular.

[ANONYMOUS.]

When the operation of churning had been going forward for half the day, I cauſed a little diſtilled vinegar to be poured into the churn, and the butter was produced within half an hour afterwards. It has ſince been regularly made uſe of for this purpoſe, and always with the deſired ſucceſs. My experiments have not as yet aſcertained the exact quantity of the acid which is neceſſary to produce the proper effect, nor the preciſe time of its being mixed with the cream. But I apprehend, a table-ſpoonful or two to a gallon of cream will be ſufficient; nor would I recommend it to be applied till the cream has undergone ſome conſiderable agitation.

[*By Mr.* CROCKER, *Frome.*]

It is not within the compaſs of a letter, that inſtructions can be fully given for making cheeſe and butter; yet, as detached obſervations on thoſe ſubjects may ſometimes have their uſe, I ſend you a recipe for making rennet for curdling cheeſe.——Take the *abomaſa*, commonly called the vells or pokes of calves, killed before they have fed on vegetables, and waſh them in clean water, ſalt them well, and lay them in ſalt for two months; then, with the ſalt about them, hang them up in a coarſe bag in the chimney (not too near the fire) for ten months. In the ſpring following, when the cowſlip is in full bloom, gather a quantity thereof, and pick the petals from the calixes, and boil them in a ſufficient quantity of water for a quarter of an hour, with the proportion of a pound of ſalt and an ounce of allum to every twelve pints of water. Let this brine ſtand to cool until the next day, when it may be ſtrained off from the cowſlips. To every gallon of this brine put in two pokes, and let them remain four days, at which time you may bottle it off, putting two or three cloves and as many grains of all-ſpice into each bottle. Let the bottles be corked tight, and the rennet will keep good a year or more. Two large ſpoonfulls of rennet thus prepared, will coagulate a hogſhead of milk. After the pokes have been thus uſed, let them drain dry, and ſalt them afreſh for a fortnight, and they will ſerve again, nearly as well as before.

[*By Mr.* HAZARD, *of Stoney-Littleton.*]

The dairy-houſe ſhould always be kept in the neateſt order, and ſo ſituated as that the windows or lattices never front the ſouth, ſouth-eaſt, or ſouth-weſt; lattices are alſo to be preferred to windows, as they admit a more free circulation of the air than *glazed* lights poſſibly can do. It is hardly poſſible in the ſummer to keep a dairy-houſe too cool; on which account none ſhould be ſituated far from a good ſpring or current of water. They ſhould be neatly paved either with red brick or ſmooth hard ſtone, and laid with a ent, ſo that no water may lodge; this pavement well waſhed in the ſummer every day; and all the onging to the dairy ſhould be kept perfectly clean; we ever ſuffer the churns to be ſcalded in the dairy, that ariſes from hot water will injure the milk.— r receptacles for milk are earthen pans, or wooden undles, but none of theſe ſhould be lined with it mineral certainly contains a poiſonous quality, ſome degree affect the milk.

ſpect to making of butter, it is right to obſerve, reater the quantity made from a few cows, the be the farmer's profit; therefore he ſhould never it what are eſteemed good milkers. It ſometimes at ſome of a cow's teats may be ſcratched or as to produce foul or corrupted milk; when this we ſhould by no means mix it with the ſweet milk, to the pigs; and that which is conveyed to the e ſhould remain in the pail till it is nearly coo ſtrained, if the weather be warm; but in froſty ſhould be immediately ſtrained, and a ſmall quanng water may be mixed with it, which will cauſe ce cream in abundance, and the more ſo, if the its have a large ſurface. After the butter is ſhould be immediately waſhed in many different it is perfectly cleanſed from the milk. The cheeſe- two pieces of wood for their butter; and if thoſe very hot hand were to uſe ſuch, they might work o as to make it more ſaleable.

ho uſe a pump-churn muſt endeavour to keep a ke, nor ſhould they admit any perſon to aſſiſt pt they keep nearly the ſame ſtroke; for if they ſlowly, the butter will in the winter *go back*, as it nd if the ſtroke be more quick and violent in the ſummer, it will cauſe a fermentation, by which means the butter will imbibe a very diſagreeable flavour. Where people keep many cows, a barrel-churn is to be preferred; but if this be not kept very clean, the bad effects will be diſcovered in the butter.——In many parts of this kingdom they colour their butter in winter, but this adds nothing to its goodneſs; and it rarely happens that the farmers in or near Epping uſe any colour; but when they do it is very innocent. As they make in that county but very little cheeſe, ſo of courſe very little whey butter is made, nor do I wiſh any perſon to make it, except for preſent uſe, as it will not keep good more than two days; and the whey will turn to better account to fatten pigs with; nothing feeds them faſter, nor will any thing make them ſo delicately white. But no good bacon can be made from pigs thus fatted.——Land whereon cows feed very often affects the butter. If wild garlick, charlock, or May-weed, be found in paſture grounds, cows ſhould not feed therein till after they have been mown.

The double Gloceſter is a cheeſe that pleaſes almoſt every palate; the beſt of this kind is made from new, or (as it is called in that and the adjoining counties) *covered milk*; an inferior ſort is made from what is called *half-covered milk*; though when any of theſe cheeſes turn out to be good, people are deceived, and often purchaſe them for the beſt *covered milk cheeſe*; but farmers who are honeſt have them ſtamped with a piece of wood made in the ſhape of a heart, ſo that any perſon may know them. It will be every farmer's intereſt (if he has a ſufficient number of cows) to make a large cheeſe from one meal's milk; this, when brought in warm, will be eaſily changed or turned with the rennet; but if the morning or night's milk be to be mixed with that which is freſh from the cow, it will be a longer time before it turns, nor will it change ſometimes without being heated over the fire, by which it often gets duſt or ſoot; nor ſhould I forget ſmoak, which will give the cheeſe a very diſagreeable flavour

When the milk is turned, the whey ſhould be carefully ſtrained from the curd, which curd ſhould be broken ſmall with the hands; and when it is equally broken, it muſt be put by little at a time into the vat, carefully breaking it as it is put in, which vat ſhould be filled an inch or more above the brim, that when the whey is preſſed out it may not ſhrink below the brim; if it does, the cheeſe will be worth very little. But firſt, before the curd is put in, a cheeſe-cloth or ſtrainer ſhould be laid at the bottom of the vat, and this ſhould be ſo large, that when the vat is filled with the curd, the ends of the cloth may turn again over the top of it. When this is done, it ſhould be taken to the preſs, and there remain for the ſpace of two hours, when it ſhould be turned, and have a clean cloth put under it, and turned over as before. It muſt then be preſſed again, and remain in the preſs ſix or eight hours, when it ſhould again be turned, and rubbed on each ſide with ſalt, after which it muſt be preſſed again for the ſpace of twelve or fourteen hours more; when, if any of the edges project, they ſhould be pared off; it may then be put on a dry board, where it ſhould be regularly turned every day. It is a good way to have three or four holes bored round the lower part of the vat, that the whey may drain ſo perfectly from the cheeſe as that not the leaſt particle of it may remain.

I am perſuaded as good cheeſe might be made in other counties, if people would adhere to the Stilton plan, which is this:—They make a cheeſe every morning, and to this meal of new milk they add the cream taken from that which is milked the night before; this, and the age of their cheeſes, I am almoſt confident, are the only reaſons why they are preferred to others; for, from the niceſt obſervation, I could never perceive that their land was in any reſpect ſuperior to that of other counties. Excellent cream-cheeſes are made in Lincolnſhire, by adding the cream of one meal's milk to milk which comes immediately from the cow; theſe are preſſed gently two or three times, turned for a few days, and are then diſpoſed of. Many people give ſkimmed milk to pigs, but the whey will do equally as well after cheeſes are made from this milk; ſuch cheeſes will always ſell for at leaſt two-pence per pound, which will amount to a large ſum annually where they make much butter.—*Oct.* 1785.

[*By Mr.* PRYCE, *of Sarum, then at Rome.*]

As the attention of the Society is particularly directed to ſome dairy counties, it may not perhaps be unacceptable, if I ſend you an account of the method of making the famous Parmeſan cheeſe.—At ten o'clock in the morning, five brents and a half of milk, each brent being about forty-eight quarts, were put into a large copper, which turned on a crane, over a ſlow wood-fire, made about two feet below the ſurface of the ground. The milk was ſtirred from time to time; and, about eleven o'clock, when juſt luke warm, or conſiderably under a blood-heat, a ball of rennet, as big as a large walnut, was ſqueezed through a cloth into the milk, which was kept ſtirring. This rennet was ſaid to have been purchaſed of a man at Lodi, famous for the compoſition; but that it was principally made of the ſame part of the calf as we uſe in England for that purpoſe, mixed up with ſalt and vinegar: it appeared to me to be alſo mixed with old cheeſe. I much doubt whether there was any great ſecret in the compoſition: but it ſeems to me, that the juſt proportion of rennet is a matter of conſequence, which is not in general ſufficiently attended to. By the help of the crane, the copper was turned from over the fire, and let ſtand till a few minutes paſt twelve; at which time the rennet had ſufficiently operated. It was now ſtirred up, and left to ſtand a ſhort time, for the whey to ſeparate a little from the curd. Part of the whey was then taken out, and the copper again turned over a fire ſufficiently briſk to give a ſtrongiſh heat, but below that of boiling. A quarter of an ounce of ſaffron was put in, to give it a little colour; but not ſo unnaturally high as ſome cheeſes in England are coloured; and it was well ſtirred from time to time. The dairy-*man* (this is not women's work in Italy) frequently felt the curd. When the ſmall, and, as it were, granulated, parts felt rather firm, which was in about an hour and a half, the copper was taken from the fire, and the curd left to fall to the bottom. Part of the whey was taken out, and the curd brought up in a coarſe cloth, hanging together in a tough ſtate. It was put into a hoop, and about a half-hundred weight laid upon it for about an hour; after which the cloth was taken off, and the cheeſe placed on the ſhelf in the ſame hoop. At the end of two, or from that to three days, it is ſprinkled all over with ſalt: the ſame is repeated every ſecond day, for about forty to forty-five days; after which no further attention is required. Whilſt ſalting, they generally place two cheeſes one upon another; in which ſtate they are ſaid to take the ſalt better than ſingly.

The whey is again turned into the copper, and a ſecond ſort of cheeſe is made; and afterwards even a third ſort, as I was informed;—a piece of œconomy which I have not known practiſed in England.—*Jan.* 1793.

General Hints relative to Agriculture.

[Anonymous.]

THE low lands in moſt counties are beſt adapted for paſture. The graſſes moſt natural to them are better kinds than in elevated ground. Thoſe which, from being ſituated along the ſides of rivers, are moſt rich and leaſt liable to be affected by drought, ſhould never be ploughed, unleſs for hemp, flax, or cole, [rape.] For corn will ſuſtain drought better (even on high lands) than graſs of any kind worth ſtanding for hay. Lands that are moderately ſituated with reſpect to height and water, are beſt for corn; but ſuch lands ought alſo to be laid down to graſs once in ten or twelve years, or oftener.

Of all the articles in trade, none is ſo valuable as corn. It is a commodity of all others the moſt important. A nation that ſupplies another with corn, makes that other pay her labourers, and contribute to the increaſe of her wealth and power.——Wherever agriculture flouriſhes in the greateſt perfection, it is generally carried on to more advantage by tenants, than by the owners of lands. But where Agriculture is little underſtood, and badly practiſed, it is generally beſt carried on in large farms, and by the owners. Improvements muſt firſt begin among men of property, who have large farms; the tenants of ſmall farms cannot run riſks.

On Vegetation and the Food of Vegetables.

[*By Major* Velley.]

IN the ſeventh page of the "Outlines of Agriculture," Dr. Hunter thus expreſſes himſelf:—"I lay it down as "a fundamental maxim, that all plants receive their principal "nouriſhment from oily particles incorporated with water, "by means of an alkaline ſalt or abſorbent earth." Having ſupported this hypotheſis by various arguments, he notices a preparation as follows:

> One drachm of Ruſſia pot-aſh diſſolved in two ounces of water, then add two ſpoonfuls of oil:—p. 19.

This mixture, the author aſſerts, "is adapted to all the purpoſes of vegetation."

Pleaſed with the information, I determined to give the faireſt trial to the experiment, and choſe a piece of ground which was freſh, and had not received any manure. In this I made ſix contiguous beds. I then marked out in each bed one hundred and twenty-eight ſpots, four inches aſunder every way. In the firſt bed I planted the ſame number of barley ſeeds, which had been ſteeped three days in the above mixture. After this, I planted in the ſame manner, and in the adjoining bed, the ſame quantity of ſeeds *dry* and *not ſteeped*; but before the ſoil was cloſed upon them, I poured into every hole two thirds of a drachm of the ſaid compoſition—a quantity ſo ſmall as ſcarcely to fill a tea-ſpoon, and which could not have been ſuppoſed to produce any viſible effect. I then planted in the third bed the ſame number of ſeeds in their natural ſtate, *unprepared* and *without any* compoſition.

The following obſervations I made with great accuracy: The ſeeds which had been ſteeped did not make their appearance ſo ſoon by eight or nine days as the grain which had been planted *without any* preparation: and thoſe ſeeds, upon which the mixture had been poured, continued *ſtill longer* in the ground, inſomuch that I thought they had been entirely deſtroyed; at laſt, however, they came up, though but ſparingly, and *leſs* in quantity than thoſe which had been ſteeped:—but both ſorts were far leſs productive than thoſe which had been *totally unprepared*. The laſt produced near double the quantity to the next beſt, as appeared from the accounts of the relative productions of the different beds.——I repeated the ſame experiment with oats, in the ſame manner as before ſtated, in every reſpect, and planted them in the three adjoining beds: and it was ſingular enough to obſerve the ſame effects preciſely as to the time of their coming up, and of their ripening, as well as with regard to their produce, which I had before remarked in the barley. In both inſtances, the *unprepared* grain was much more forward in its appearance and ſtate of maturity, as alſo much more abundant, than either of the other two.

[*By Mr.* WIMPEY; *June* 1782.]

Quære 1ſt. Suppoſing the opinion to be true, which almoſt univerſally prevails, that arable land, after having borne a few crops, muſt remain ſome time *fallow* before it is fit to produce the ſame courſe of crops again: Whence proceeds the neceſſity of ſuch fallowing? *2dly.* Does the earth by the growth of vegetables loſe any particles neceſſary for future vegetation?

That the earth, by the growth of vegetables, is exhauſted of thoſe principles which are neceſſary to future vegetation, is abundantly manifeſt from the univerſal experience of mankind. All ſoils become weaker and poorer in proportion to the crops they have borne. This is not a matter of mere opinion, for the moſt fertile ſoils have and may be made unfertile by conſtant cropping, and the practice of all ages and countries fully evince the ſame; therefore the true anſwer to this queſtion is, that vegetables do take from the earth they grow in the particles neceſſary to vegetation, and conſequently a temporary barrenneſs may be induced by over or a too long continued cropping.

But though it is certain, that rich or fertile land may be rendered unfertile or barren by extravagant and unreaſonable cropping; it does not follow that fallowing is abſolutely neceſſary to reſtore its fertility, becauſe the ſame end may be as effectually anſwered by other means. Fallowing may be neceſſary to clean the ground, and deſtroy the weeds which ſloth or bad huſbandry may have occaſioned, and which perhaps could not be eaſily extirpated by any other means; but it cannot be neceſſary to reſtore fertility, unleſs in ſuch ſituations as proper manure cannot be obtained but at prices too exorbitant for the produce to repay with profit. Arable land may be ſo ſituated and circumſtanced as to admit of no amendment from manures; as when they are far diſtant from towns, and deſtitute of marle, lime-ſtone, chalk, and every thing that is known to renovate the fertility of exhauſted and impoveriſhed land. Here then the only reſource is *fallowing*, and the neceſſity of it proceeds, firſt, from the principles or particles neceſſary to the growth of vegetables being exhauſted by preceding crops; and ſecondly, by the want of manures neceſſary to reſtore and repleniſh the ſoil with thoſe principles which the preceding crops had deprived it of and carried off.——Here, indeed, a very intereſting and important queſtion may ariſe: How, or by what means, can land lying fallow or unoccupied have thoſe particles neceſſary to fertility reſtored? That fallowing has this beneficial effect cannot be denied, becauſe all experience bears indiſputable evidence to the truth of it. The effect is univerſally admitted, but the cauſe is the great *deſideratum*. The atmoſphere is the great repoſitory, the grand magazine, which contains the fertilizing principles, and it is from that great and inexhauſtible ſource that all the benefit of fallowing is derived. But pulverization is abſolutely neceſſary to prepare the ſoil for the reception of thoſe particles; for earth in its natural compact ſtate admits neither rain, ſnow, dew, nor any of thoſe finer and more ſubtilized particles which are continually floating in the air, deſcend with them to the earth, and are carried off in the ſtreams they form on the ſurface, together with ſuch other particles as they take up and arreſt in their way. So that rain, ſnow, dews, &c. which ſink into, and are imbibed by, a well-cultivated ſoil, and enrich the ſame; rather impoveriſh a compact ſoil, by carrying off thoſe adventitious particles it may happen to have on its ſurface, together with thoſe that deſcend with them from the atmoſphere. That is, land well cultivated and pulverized is conſtantly enriched and improved by the weather; while that which is neglected not only receives no benefit from the atmoſphere, but is liable to have what little chance has beſtowed upon it, waſhed away by haſty ſhowers and heavy rain, which cannot penetrate the obdurate ſurface.

Queſtion 3d. What are thoſe particles that are neceſſary to vegetation?

The purport of this queſtion I underſtand to be, Of what nature or conſtitution are thoſe particles which enter into the eſſence of plants, aſſimilate with it, and increaſe their bulk; or, in other words, which feed and ſupport plants in every ſtage of their growth, from their firſt embrio ſtate to that of maturity, or higheſt ſtate of perfection?

The daily practice of every huſbandman clearly ſhews, that thoſe fertilizing particles (of whatever they conſiſt) are to be found in every article of the vegetable and animal kingdom, that is capable of fermentation, and diſſolution by putrefaction. The dung-heap, which is a promiſcuous combination of theſe ſubſtances, when in the higheſt ſtate of putreſcence, is perhaps the ſtrongeſt and moſt efficacious of any general manure. Were this to be had in quantities equal to the farmer's wiſhes, at a moderate price, his fields might

tile. It is a matter perfectly unintereſting to
farmer, by what name the philoſophical chy-
thoſe fertilizing principles. They may be oils,
water, earth, ſome or all combined together.
ge of this is of no importance to him. He is
eed to chymical analyzation, but he is perfectly
ith the groſs ſubſtance in which thoſe particles ſo
reſtore fertility to his exhauſted fields are to be
xperience has taught him the beſt ſeaſon, and
al method, of applying them for the benefit of
This may be called the natural means of pro-
bulum or food of plants, as properly as giving
v, or hay to a horſe. But there are other means
ſoils, which communicate none of theſe particles
ceſſary to the ſupport and growth of plants.
prehend, conſidered as a manure, is chiefly to
for its mechanical properties; for neither in its
te ſtate doth it contain any of thoſe nutritive
ſſary to the growth and increaſe of bulk in plants.
e ſtates and under ſome circumſtances is ſo very
ing from lime in other ſtates and under other
s, that unleſs its condition be pretty accurately
is ſcarcely poſſible to treat intelligibly about it.
it is the *ſine qua non* of ſucceſsful practice; with
ain heavy expence, attended with no advantage.

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ingenious writer, in another letter on the ſame
—A gentleman's gardener keeps no account of
oſs for his maſter. His intereſt often depends
odneſs of his crops, and his credit always upon
le and beauty of his fruit, &c. but it is no object
hether a cucumber or a pound of potatoes ſtand
five farthings or five ſhillings; or whether a melon

or a pine-apple coſt him a penny or a pound. His ambition is to excel. The pleaſure of making computations, and the advantages attending them, he ſagaciouſly leaves to thoſe whom it may more nearly concern. However, ſhould we enquire into the foundation and ſupport of his art, it would appear that his principal dependance is upon manure, for till his ſoil is rendered fertile, his art and his labour would be fruitleſs and vain. Surely it is no argument, that proper manure will not reſtore fertility to an exhauſted and debilitated ſoil, becauſe it will not produce ſimilar effects in thoſe which have been already drenched and ſurfeited with too much. A gardener is generally profuſe in the uſe of dung, as long as he finds it will force his crops; but the time will come, when by this means the ſoil will become ſo rich, light, and porous, that it would bear nothing but a muſhroom or a fungus, a pompion or a gourd.

Let a fertile ſoil continue to be planted with any one kind of grain whatever, till its ſtrength be exhauſted, and no longer capable of bearing that particular grain, it will be found equally incapable of producing a crop of any other kind which requires an equal degree of ſuſtenance. Should a fertile field be ſown firſt with wheat, then with barley, then with oats, and then with rye, it would be found ſuch field would bear neither turnips nor clover, till its fertility was reſtored either by manure or by fallowing. The true concluſion therefore is, if land be exhauſted, whether by the growth of one particular kind of plant, or of many kinds in ſucceſſion, its fertility muſt be reſtored before it can bear a profitable crop of any other kind of vegetable, though it had not been planted with it for an age before.

The animal and vegetable kingdoms ſeem to be the mutual ſupport of each other, with this difference only; the latter is abſolutely neceſſary to the ſupport of the former, but the former not to the latter, it having a reſource within itſelf, and can ſubſiſt without it, though evidently not to equal advantage.——All fertile ſoils contain particles neceſſary to the growth of vegetables. All vegetables in their growth neceſſarily take from the earth as many of thoſe particles as are uſeful to their growth and ſupport; by which means the moſt fertile ſoil will in time become poor—that is to ſay, when it is exhauſted, or nearly exhauſted, of ſuch neceſſary particles. But theſe neceſſary particles may be ſupplied, and fertility reſtored, by the growth of more vegetables, provided the crop be not taken off from the land it grew on, but ſuffered to remain upon it, or rather at a proper ſtage of its growth ploughed into it.

[*By Mr.* WIMPEY; *Dec.* 1785.]

Various are the opinions of the learned concerning this matter. Some ſuppoſe the food of plants to be water; ſome earth; others air, nitrous ſalts, oil, &c. &c. perhaps all of them wide enough of the mark. It muſt be confeſſed, we know nothing of the eſſence of things. We are not endued with faculties equal to the curious reſearch. Things are known to us by their properties only.

The principles of vegetation, and the means by which it may be promoted in the moſt ſucceſsful and beneficial manner, may be fitly divided into three general heads, and diſtinquiſhed by the terms *mechanical*, *chemical*, and *nutritive*. The *mechanical* includes every operation which tends to break, divide, and pulverize the ſoil; whether it be by ploughing and harrowing, digging and hoeing, or by any other means whatever; that being the moſt eligible which moſt effectually performs the operation at the leaſt expence.

Pulverizing the ſoil may be truly conſidered as the firſt ſtep towards an improving vegetation; not as *producing* the food or nouriſhment of plants, but of putting the ſoil into a fit condition for *receiving* it. *Chemical* principles produce much the ſame effects, but in a way we cannot ſo eaſily, nor ſo perfectly comprehend.

There ſeems to be a natural relation, connexion, and dependence, between the animal and vegetable kingdoms. No part of the terraqueous globe that we know of, that is occupied by living creatures of any kind, but is replete with vegetables proper for their ſuſtenance and ſupport; and it is equally certain, that wherever vegetables grow and flouriſh, it is ſtocked with animals in proportion thereto.

It is not many years ſince that a ſurpriſing diſcovery was made by that very celebrated inveſtigator of nature Dr. PRIESTLEY, who clearly proved by experiment, that common air, when become feculent and putrid by animal reſpiration and perſpiration, ſo as to be unfit for the common purpoſes of life, is readily purified and made wholſome by the vegetable kingdom, which imbibes and abſorbs thoſe putrid ſteams that are ſo deadly noxious to animal life. But what is moſt ſurpriſing, inſtead of growing ſickly in ſo impure an air as he expected, he found the plants were invigorated, and their growth promoted thereby; ſo that they were more freſh, green, and healthy, than thoſe which grew in common wholſome reſpirable air.

It is in the obſervation of every man, from the illiterate occupier of a cottage to the firſt gardener of a prince, that all kinds of animal ſubſtances, when thoroughly digeſted and corrupted, are the ſtrongeſt and moſt powerful promoters of vegetation. It is therefore undeniably certain, that animal ſubſtances contain thoſe principles which are the real an genuine food of plants. It is abſurd to ſuppoſe their food [illegible] earth, or water, or air, fire, or heat, or any one ſimple element or thing whatever; but it is evidently a combination f principles derived from animal ſubſtances by the che-niſtry of nature.——It ſeems then, that as the animal king-lom is entirely ſupported by the vegetable, ſo is the vegeta-le by the animal, and each is reciprocally the ſupport of, and s ſupported by, the other. The matter of each is eſſentially the ſame, each is indued with the principles of life and augmentation, though appearing under very different forms; each mutually tranſmutable into the other by the mere unaſſiſted operations of nature.—It is equally certain, that vegetation may be promoted, without laying on any manure.

The new or horſe-hoeing huſbandry depends entirely upon reducing and pulveriſing the ſoil. It cannot be reaſonably ſuppoſed, however, that the ſpade and hoe, or plough and harrow, convey any fertilizing principles. Theſe operations, which are found to render our lands ſo ſurpriſingly fertile when judiciouſly performed, only prepare the ſoil for the eaſy entrance of thoſe fertilizing principles with which the atmoſphere is abundantly replete.

It ſeems very evident then, that whether the huſbandman manures his fields from the dung-heap, or by ploughing in green vegetables, or by duly expoſing it to the unceaſing influence of the atmoſphere; the principles of vegetation, which he beſtows in either caſe, are eſſentially and ſubſtantially the ſame: They all equally originate from putrid animal ſubſtances.—Manure imperfectly digeſted, or uſed in too great abundance, often defeats the views and hopes of the planter; he may reap a great burthen of ſtraw and very little corn. The ſame thing may happen from green vegetable manure, unleſs it be ploughed in time enough to undergo a thorough fermentation, and at the laſt ploughing be intimately blended with the ſoil.

If my theory be juſt, animal ſubſtance, from whatever ſubject it is derived, or under whatever form it may appear, when it is perfectly digeſted and putrified, ſubtilized and become volatile, is the true, genuine, and ſole aliment of plants. The dunghill, which conſiſts chiefly of animal excrements, contains the greateſt quantity of nutritive principles of any ſubſtance whatever of equal dimenſions, the conſtituent parts of animals only excepted. The dunghill, therefore, is the greateſt and moſt powerful fertilizer of land; and could the farmer acquire as much of it upon moderate terms as he choſe, he might ſoon make his land as fertile as the climate would admit, or he could deſire.

All land, whatever may be its temperature, may be fertilized and improved by frequent ploughing and harrowing, if they are well timed; but all land is not equally ſuitable to the drill and horſe-hoeing culture; and ſome, though perhaps comparatively little, not at all ſo. Hilly countries, land that is rocky or abounding with large looſe ſtones, or that conſiſts of a ſtrong, moiſt, adheſive clay, is not in general ſuitable to the drill culture; but the land that is not ſuitable, I apprehend, bears no great proportion to that which is.——When land is exhauſted, quite out of tilth, and overrun with the ſtrongeſt and moſt noxious weeds, it is abſolutely neceſſary to eradicate them, to clean and pulverize the ſoil; otherwiſe the ſeed, whatever it may be, might as well be thrown on the highway, as ſown in land in that condition. It will readily occur to the reader, that this not poſſible to be done in any mode of culture but that planting in drills, and pulverizing the ſoil by ploughing and horſe-hoeing the intervals during the growth of the crop through the whole ſummer.

Wheat, turnips, lucern, and ſainfoin, and indeed every other kind of plant, when well fixed and eſtabliſhed in the ground, may be greatly promoted in their growth by the diſcreet uſe of the hoe-plough; but previous to the uſe this inſtrument, they muſt have arrived to a certain ſtage of their growth, otherwiſe the hoe-plough would entirely diſplace and totally deſtroy them.

Turnips, lucern, ſainfoin, clover, and many others, are very precarious articles, even when ſkill has been uſed, and great pains taken, to inſure a crop. Land is ſometimes ſowed with turnips three or four times to no purpoſe, and many other crops frequently miſcarry through circumſtances which human ſagacity cannot foreſee, nor human prudence remedy.—The beſt means to guard againſt ſuch a diſappointment, when any of theſe articles are to ſtand for a crop in the place they are ſowed, is thoroughly to cleanſe the ground, duly break, divide, and pulverize the ſoil, and dreſs it with a well-prepared artificial compoſt, which, if the ſeaſon ſhould not prove ſingularly unfavourable, would moſt probably give a degree of vigour to the young plants, which would totally defeat the ravages of the fly.

A plentiful crop of turnips, or of artificial graſſes, is a matter of very great importance to a farmer who has a large ſtock of cattle to feed; it therefore merits his moſt ſerious attention, how and by what means he may render the growth of thoſe articles more conſtant and certain, which in the common courſe of practice are very precarious, and not to be depended upon. For this purpoſe I would adviſe him to keep twenty, thirty, or fifty loads (the quantity proportioned to the extent of his farm) of a good compoſt always by him, ready prepared, to be uſed as occaſion may require. This may be done at a very moderate expence in the following manner:—Of a field that is conveniently ſituated, plough and harrow the head-lands, till the ſoil be well divided and in fine tilth; then take a cart-load, or forty buſhels, of good ſtrong well-burnt lime, freſh from the kiln, and place it in little heaps, about a buſhel in each, along the middle of the ſaid head-lands, about four feet diſtant from each other. This done, with a ſhovel cover the heaps of lime with four or five times its quantity of pulverized earth, and pat it down cloſe with the back of a ſhovel, ſo as to exclude both the rain and the air. In a few days, the moiſture of the earth will have diſſolved the lime, and reduced it to a powder. A workman, however, ſhould from time to time inſpect the heaps, for they will ſoon begin to heave and ſwell, and have large fiſſures in them, which muſt be carefully filled up by having more earth thrown upon them, and patted down cloſe. This muſt be repeated as often as occaſion may require; for rain would cauſe the lime to run into a kind of irreducible calx, and the air would rob it of its fertilizing quality, as it is well known it does of its medicinal virtue. When the lime is perfectly reduced to a powder, the earth and lime muſt be chopped down with a ſpade, and intimately blended and incorporated together. This is moſt conveniently done in form of a long bank or ridge, in the middle of which a large furrow or opening muſt be made, ſufficient to receive five cart-loads (forty buſhels each) of good fat ſpit dung; then the earth and lime muſt be thrown over the dung ſo as to cover the whole. In this manner it muſt lie ſome months, or till the dung is in a ſtate of diſſolution, which it will ſoon be by means of the lime. When arrived to this ſtate, it muſt again be turned over, and incorporated as intimately as poſſible, and then formed into a heap to be kept for uſe. Earth, lime, and dung, thus managed, conſtitute an unctuous ſaponaceous maſs of great fertility, and perhaps this is the moſt beneficial method of manuring with lime of any in uſe.

We will ſuppoſe the land we have to cultivate is in its nature rather poor and unfertile, and rendered more ſo by being too frequently cropped, and its culture neglected, and conſequently overrun with the worſt kind of weeds; the queſtion is, what mode of culture will bring ſuch land into proper tilth, and produce a profitable crop at the ſame time with the leaſt expence? To anſwer this purpoſe, I have already obſerved, the crop muſt be planted in rows, with intervals ſufficiently wide to admit the free uſe of the hoe-plough whilſt the crop is growing, as often as the growth of the weeds requires it. This will be three or perhaps four times, in ſuch foul land, during the courſe of the ſummer. For this purpoſe I know only of three or four articles which will by any means anſwer. Theſe are, the different ſpecies of cabbage plants, beans, potatoes, and perhaps peaſe. I have tried carrots, parſnips, turnips, turnip-rooted cabbage, lucern, ſainfoin, and every ſort of grain, but without the leaſt ſucceſs; for in ſpite of every effort, the weeds baffled all attempts, and deſtroyed the young plants that aroſe from ſeed, before the hoe-plough could be introduced. Cabbages, beans, and potatoes, were all the articles that afforded a profitable return.

A field planted with potatoes following a crop of beans, if duly cultivated with the hoe-plough, harrow, and plough with a double mould-board, would reduce almoſt any ſoil to a perfect tilth. The intervals might be prepared in good time for a crop of wheat, and the ſeed drilled in, if convenient, before the potatoes were taken up.

Rain, hail, ſnow, dews, hoar-froſt, and all the exhalations which occupy the atmoſphere, ſink into and are abſorbed by the earth, when it is kept in a looſe, light, pulverized ſtate; whereas the ſame principles on a compact hard ſoil reach no farther than the ſurface, and are exhaled by the ſun and wind, with little or no benefit to the ſoil they fall on.

On the great Fertility of a piece of Ground at Wantage

[*By Mr.* Pryce; *Jan.* 1783.]

I Was told by the owner, that previous to his purchaſing this field, twenty-ſix years ago, it was ſown with barley five years ſucceſſively. He then planted it the firſt year with beans, and it produced twelve quarters; next with wheat, of which it produced fourteen quarterrs. It has been ſown perpetually every year ſince, except one, when it was laid to clover, of which it was computed ſeven tons were mowed; after which the hay-graſs was let for five guineas. Other years it has produced of boiling peaſe ten quarters, of barley twenty quarters, and of white oats twenty-five quarters: their meaſure nine gallons to the buſhel.

Although this ground has been ſown perpetually every year, except the one year above-mentioned it has never been manured more than once. It had then a thin dunging for wheat; which grew ſo rank that it was of little value.

The ſoil is a blackiſh loam, from fourteen inches to three feet deep, on a ſtratum of ſandy ſtone, which the country people compare to fuller's earth. This ſtone falls to pieces in the air; but does not crackle in the fire, diſſolve in water, or efferveſce with vinegar. An experiment was made ſeveral years ago, of planting beeches in the ſoil alone, and others in the ſtratum alone without any ſoil; which laſt flouriſhed much, and outgrew the other.

Queries propoſed by the Board of Agriculture, and moſtly anſwered by Mr. Thomas Parsons.

1. WHAT effect, in your opinion, has the earth, in promoting the growth of plants, and bringing them to perfection? Is it of any farther ſervice, than to keep the plants ſteady and upright, and to contain at leaſt

ſome part of the nouriſhment on which they live?——*A.* The earth is a baſis for ſupporting the plant, and for enabling it to aſſume and preſerve a proper poſition. And it is the beſt vehicle for equally diſtributing to the fibrous roots that quantity of water which the plant requires for its growth; the abſorption, by means of the root, being the general mode whereby ſuch growth is promoted. The earth alſo admits the ſolar rays, imbibes warmth, and conſequently communicates that warmth to the root. It moreover allows the acceſs of air to the root.

2. Are there any plants, which will grow perpetually in the ſame ſoil; and what are they?——*A.* Timber and fruit-trees, the common herbage of paſtures from time immemorial, the natural turf upon downs and ſheep-walks. Gardens ſuffer but little change of ſoil; conſtant motion, and a ſmall addition of manure, effecting every thing.

3. Of what is a ſoil deprived, when it is ſaid to be exhauſted?——*A.* Of no ſenſible chemical quality whatever inherent in the ſoil. Suppoſing a thin ſoil to be burn-baked, when firſt broken up, and by a courſe of crops to be exhauſted, let a good dreſſing of vegetable aſhes be given it, and I ſhould expect it capable of a ſimilar courſe. The alkaline obtained by the operation at firſt may be totally loſt; but that not being originally in the ſoil, the ſoil is, by the crops it bears, reduced to its original ſtate, and may be ſupplied by a freſh quantity. In various inſtances, analogy may be preſerved, tho' circumſtances vary; as ſome lands may require a calcareous, an acidulous, or ammoniacal manure, inſtead of an alkaline. Adventitious qualities may be communicated, exhauſted, and reſtored, the inherent character remaining.

4. What do you ſuppoſe to be the compoſition of the moſt fertile ſoil?——*A.* True original earth; that produced by a compleat putrefaction of animal and vegetable ſubſtances.

5. Do you ſuppoſe that a ſoil, in which there is no calcareous matter, will produce grain or peaſe in perfection?——*A.* Good garden mould, in which there is no *perceptible* calcareous matter, will produce both in perfection.

6. Whence is it, that calcareous ſoils are ſo favourable to the growth of clover?——*A.* From a dryneſs peculiar to calcareous ſoils. I have often ſeen the ſmall hop-clover thrive on the tops of walls, where the ſoil was merely the ſcraping of roads, or pulveriſed freeſtone, and from its form incapable of retaining moiſture.

7. Muſt not ſoils, in order to be perfect, have the power of retaining a ſufficient quantity of moiſture?——*A.* Moſt aſſuredly. Different vegetables, however, require different proportions of moiſture, and conſequently ſoils capable of retaining different proportions.

8. What are the beſt means of giving them that property?—*A.* By a due admixture of alkaline ſubſtances, if the ſoil be in ſufficient quantity; if not, it ſhould be increaſed.

9. Are not ſoils of too porous a quality, ſuch as thoſe which conſiſt almoſt ſolely of ſand or gravel, in a great meaſure barren; not only becauſe they hold no water, but alſo becauſe any manure put on them is ſoon carried down and loſt, before it has had time to operate?——*A.* The pores of gravel are too minute to imbibe moiſture freely, if at all. Yet, if the ſtratum be of conſiderable depth, the lower part will retain moiſture; thus eringo and ſamphire often grow in ſuch ſtrata, and heath in inland ſituations. For cultivation, perhaps, a liberal ſupply of a viſcid loam, approaching to the nature of clay, might be advantageous; a baſis thus formed would ſupport the growth of ſome kinds of vegetables, and their decay would increaſe and improve the ſoil.

10. Have you found it of ſervice to change the ſeeds of plants, from one ſoil or climate to another; and why?——

A. From the almoſt universal adoption of the practice, it ſeems that experience has fully juſtified it. In the caſe of exotics that do not arrive to full perfection in an alien climate, it does not ſeem wonderful; but in the caſe of naturalized vegetables, I cannot explain it.

11. What effect has the air in promoting the growth of plants, and bringing them to perfection?——*A.* By checking the too rapid growth, it renders the plant robuſt and firm; by its motion, it agitates the plant, and thereby contributes to its health, analogous to exerciſe in animals—carrying off noxious effluvia from the ſoil, and putrifying leaves, and alſo the perſpirable exudation of the plant.

12. Do you conſider pure air to be neceſſary for that purpoſe?——*A.* If by pure air be meant good atmoſpherical air, undoubtedly yes.

13. Do you ſuppoſe that roots, as turnips, potatoes, &c. extract nouriſhment from the air by their ſtems or leaves, and hence exhauſt the ſoil leſs than grain? Or do they fertilize land by the ſubſtances they throw off, and leave behind them?——*A.* As far as air is a medium for light and humidity, they may; but I think not from the air itſelf; and the greater proportion of foliage, the more benefit perhaps from light and aqueous vapour; but I am diſqualified for explaining how theſe plants improve the ſoil, unleſs by their decayed leaves and ſtalks.

14. Do not young trees thrive better, when their roots are near the ſurface, and not too deeply buried in the earth? Would they thrive in heaps of ſtones, which, it is ſaid, has been ſucceſsfully tried in France?——*A.* I believe the affirmative is generally admitted. Stones are often placed *underneath* a young tree, to prevent a tap-root, and obliging it to extend its roots horizontally. Vines flouriſh amongſt ſtones and rubbiſh, but I recollect no other tree that does.

15. What effect has water in promoting the growth of plants, and bringing them to perfection?——*A.* As I do not at preſent believe that one particle of ſalt, oil, or earth, is abſorbed from without into the conſtitution of the plant, I conſider water and light (but chiefly the former) as conſtituting its whole nouriſhment; in aid of which, ſoil, and air, and warmth are neceſſary.

16. What kinds of water are favourable, and what are injurious, to vegetation?——*A.* In the floating countries the firſt warm guſh from the ſpring is preferred. Mineral and metallic waters are injurious.

17. Would not a tree, if exhauſted of its ſap, periſh?——*A.* Yes, and if the circulation be interrupted.

18. What is the effect of dew upon plants; and to what extent is it favourable to vegetation?——*A.* Perhaps it checks evaporation, favours ſecretion, and by a grateful coolneſs invigorates. I have never underſtood but its utility was univerſal, unleſs we except plants not naturalized to our climate.

19. What are the effects of light and heat, in promoting the growth of plants, and bringing them to perfection?——*A.* Fruits moſt expoſed to the ſun are the fulleſt coloured and the richeſt flavoured. I conjecture, that light improves or produces colour, and heat the flavour. From the general direction and appearance of trees, and their foliage, I think they are influenced by both; how that influence is exerted, is not eaſily aſcertained.

20. Do you know of any plants raiſed totally in dark places? Do they produce flowers or fruit in that ſituation?——*A.* I have ſeen a ſpecies of moſs like combed wool, in wine-cellars, but know nothing of its flower or fructification.

21. Is not light neceſſary to give plants their proper colour and flavour?——*A.* Fruits and flowers demonſtrate this.

22. Does not heat increaſe ſaccharine matter in grain, and in that reſpect bring plants to greater perfection?——*A.* This fact ſeems to be well eſtabliſhed, from a long compariſon between cold and hot ſummers, and the correſponding ſtate of grain and fruit.

23. Do not any ſeeds, which lie upon the ſurface of the ground uncovered, periſh from the light and heat?——*A.* They will ſwell, and perhaps ſend out an inceſſant germ or root; but wanting a proper baſis, will exhauſt themſelves and periſh.

24. Do plants grow moſt in the day or the night time?—*A.* I can only propoſe an anſwer from general obſervation, having never critically attended to the query. My opinion is, that night is the period for increaſing the firmneſs and rigidity proper for plants, that the hours of light are the time for enlarging the dimenſions, and that the growth is in proportion to the continuance of light; other circumſtances equal.

25. What effect have manures in promoting the growth of plants, and bringing them to perfection?——*A.* When perfectly reduced to pure mould, by applying to the roots a kind of earth free from all indurations, eaſily communicative of the aqueous fluid, and eaſily admitting the extenſion of the delicate fibres. Indurations, I conceive, to be the great evil to be guarded againſt, with regard to moſt plants in cultivation. Recent manure multiplies inſects, and poiſons the roots. I believe much injury is occaſioned by inattention to this cirumſtance. I have known recent manure check vegetation to my vexation.

26. What are the effects of the different kinds of manures, of which you have have had experience?——*A.* Stable manure, thoroughly rotted, is an addition of fine, ſoft, looſe earth; vegetable aſhes abſorb and retain moiſture. Sand worked into the ſoil renders it lighter and hollower, favour-

able to tap-rooted vegetables. My experience goes no farther. Calcareous additions may be friendly to plants affecting a dry ſoil; but I wiſh for nothing in a garden of a calcareous or vitrified nature.

27. What is the proper mode of application; mixing them with the ſoil, laying them in drills, or top-dreſſing?——*A.* By trenching-in, if the manure be incompletely rotted, in order that by the next digging it may be in a proper ſtate for an intimate mixture with the ſoil. Trenching-in is proper alſo for ſowing, ſome degree of warmth is excited, and it will be thoroughly rotted before the roots can reach it.

28. Do thoſe manures promote the growth of plants, by making the ſoil more porous and open for their roots, by exciting a fermentation in the ſoil, by affording nouriſhment to the plant itſelf; or in what manner do they operate?——*A.* The anſwer muſt be matter of opinion; and it is my opinion, than animal and vegetable manures are in a proper ſtate for improving the ſoil *only* when reduced to pure earth, and that they aſſiſt vegetation, as in anſwer to query 1.

29. Is it better to mix a great quantity of manures together into a compoſt, or to lay them on ſeparately?——*A.* Convenience gives the preference to maſſes of manure, and in large bodies the fermentation advances, and the diſſolution of the ſubſtances follows much more rapidly.

30. Do you know of any practices by which the quantity of manure could be increaſed?——*A.* Neatneſs in management would increaſe it; always pulling up and paring off weeds, from ditches, fences, and the ſides of the roads, as well as thoſe among the crops, would accumulate a ſtock of fine mould when rotten. Soot, aſhes, offal, urine, and ordure; every thing produced by man and beaſt ſhould conſtitute the farmer's treaſure.

31. What are the effects of dung and other manures, upon the taſte, flavour, and wholſomeneſs of vegetables?——*A.* If the dung be completely rotten, the effects will be quickneſs of growth, ſucculence, criſpneſs, and delicacy of flavour. Thus cucumbers in a frame are (in theſe reſpects) ſuperior to thoſe grown on open beds; and thus the productions of well-manured gardens are ſuperior to thoſe raiſed in poor land and bleak ſituations. Medical herbs raiſed in the latter ſituations will be preferable to thoſe on better ground, becauſe a ſlow growth is favourable to the degree of their medical virtue.

32. What effects has the culture of the earth on the growth of plants, and bringing them to perfection?——*A.* By frequent motion the internal parts are brought into uſe, the contexture is diſſolved, and the whole maſs ſo comminuted as to favour the growth of the root, and ſupply it with moiſture.

33. Do not young trees, when tranſplanted, grow better if the ſoil has been ploughed, or trenched, and thoroughly pulverized?——*A.* Moſt certainly; in a ſtiff ſoil, with only a hole dug to admit the tree, the tree is generally ſlowin its progreſs, and often ſtunted and moſſy; let the root have liberty to run with eaſe, and the branches would be better formed, and make greater progreſs.

34. Is it not better for young trees, that potatoes, turnips, or other vegetables, ſhould be raiſed amongſt them; and how long ſhould that be practiſed?——*A.* Standards in garden-ground are generally more thriving, and more regular bearers than in orchard, where the ſoil is never ſtirred.

35. Have you found any ſubſtances in the earth injurious to vegetation; and of what nature are they?——*A.* Excepting a few vegetables, and until reduced to earth, I have found aſhes of foſſil coal hurtful.

36. What are the kinds of vermin in the ſoil, which you have found hoſtile to vegetation?——*A.* Worms at the root, the ſoft ſnail to the young plant, caterpillars to grown vegetables; and the houſe-ſnail, the waſp, and the common fly to fruits, to which add the millepedes, earwig, and centipedes.

37. Do you know of any mode of deſtroying them?——*A.* Avoiding recent manure, freſh lime, bottles for waſps and flies, a quick eye, and an active hand, are the beſt remedies I know. Diligence and cleanlineſs will do wonders.

38. What are the kinds of inſects in the air, which you have found hoſtile to vegetation?——*A.* Inſects intended here, are limited uſually to particular ſpecies, or ſimilar ſpecies of plants. In the fly-ſtate they propagate ſufficiently, without ſuppoſing them to float in the air. The bloom of the apple, pear, and cherry, is very often injured, or deſtroyed, by a ſmall caterpillar at the heart; the egg of which was, I ſuppoſe, depoſited in the bud in the preceding year.

39. Have you diſcovered any method of preventing their ravages, or deſtroying them?——*A.* The hiſtory of this inſect would aſcertain the beſt time for ſmothering the trees, which is a good practice; the period of laying the egg is the time, were it known.

40. What, in your opinion, is the cauſe of the blight, and the means of guarding againſt it?——*A.* Blight is to me an unintelligible word. Froſts in the ſpring, at the period when the bloſſom is quitting the tender forming fruit, often deſtroy whole crops. The firſt tender opening leaf-buds are often deſtroyed in the ſame manner; a ſecond effort being neceſſary, the ſhoots and leaves are very backward, and the tree, by the ſevere check, much injured. Late froſts do more injury to trees than I believe any thing beſides. Shrivelled bloſſoms and leaves form a receptacle for inſects, and inſects are often charged unjuſtly with the crime. Froſts are, how-

ever, deſtructive of the inſect tribes, but the larva of inſects lodged ſecurely by the parent are not eaſily injured until they come into motion, when the ſmall birds make great havock amongſt them. Early blights mean, I think, the depredation of worms (or rather caterpillars) in the buds, or the effects of froſts.

41. Are there any plants, or ſhrubs, the ſmell of which is deſtructive to inſects?——*A.* Elder, though preyed on itſelf by ſome inſects, is, I believe, injurious to others. Tobacco applied in powder is uſeful; and the tobacco plant I have never ſeen attacked by any. But ſublimate (as in the medicated tar) is the moſt efficacious, where it can be uſed with ſafety.

42. Have you ever tried fumigating or other inſtruments, for deſtroying inſects; and how have they anſwered?——*A.* General practice induces us to conclude, that the ſmothering of trees by burning weeds is beneficial, by ſuffocating inſects.

43. Are there any means of increaſing the quantity of ſeeds? Are there any means of increaſing the ſaccharine matter in fruits? Are there any means of increaſing the ſize of fruits, without rendering them more watery? Are there any means of increaſing the flavour of fruits?——*A.* I am not qualified to give ſpecific anſwers to theſe queries; generally, however, a pure healthy ſoil will produce pure and healthy vegetables, and vegetables ſo characterized will ſupply the moſt perfect fruit and ſeed. Thoſe methods, therefore, which contribute to accompliſh the firſt object, will (allowing for difference of ſeaſon) ſecure the ultimate object. Imperfect manures, partially putrified, often do injury to the firſt crop. A ſuper-abundance of water, as in water-meadow, will generally increaſe the product greatly; but it is doubtful if the product be ſo replete with ſaccharine nouriſh-

ment as in other caſes. A depth of ſoil is very deſirable in almoſt all caſes; eſpecially where a large, and particularly a long, root is wanted: and, it is my opinion, that the advantage ariſing from ſome manures is principally owing to an increaſe of the ſoil. An enlargement of fruit, of the ſame kind, will generally be attended with a loſs of flavour, or the ſame quantity of flavour will be diffuſed through a larger ſpace, and therefore appear weaker, or more diluted: as in golden-pippins, apricots, &c.

44. Since the flowers of ſeveral plants are uſed in dying, ſuch as the carthamus; or in medicine, ſuch as the crocus, what are the methods of rendering plants more prolific in flowers, or of increaſing the number of flower leaves, or parts uſed for dying, or in medicine.——*A.* Shade and too much moiſture are diſcouraging to bloom. When in bloom, plants expend faſt, and need liberal ſupplies; but a ſoil rather dry is beſt for multiplying the bloſſoms.

[*By Mr.* SMITH, *Clapham.*]

In 1754, my brother was at Straſburgh, and ſeeing ſome Indian corn growing, he gathered an ear or cone, and preſerved it with the flag on it. It had lain by unregarded till laſt year, when meeting with it, and the date, place, and time of growth being on it, I was induced to try if it would grow. Feb. 28th, 1788, I took ſix grains, ſoaked them in water twenty-four hours, put them in earth in pots, and then in in a hot-houſe. In about twenty days they began to appear, and four out of ſix grew to about three feet high; two produced the ear completely formed, a cone of which I ſend. The pots were taken out of the houſe the latter end of June, and the ears gathered the beginning of October. Six other grains were planted in the garden without ſoaking, but did not produce even ſigns of vegetating.

Of Clovers and different Species of Graſs.

A Berkſhire Farmer, who ſigns himſelf C. T. finding a crop of Oats laid down for graſs in a very foul condition, ploughed it up after harveſt, gave it a winter fallow and ſpring tillage: then, with another crop of oats, ſowed ſome of the beſt graſs ſeeds he could get. By this means he procured a plant of graſs equal to the beſt meadow.

Much converſation having paſſed concerning a remarkable ſpecies of graſs at Orcheſton St. Mary, or Maddington, in Wiltſhire, the Secretary was directed to enquire, and received a letter from a gentleman of Dorcheſter in anſwer:—

" This graſs is found at Orcheſton St. Mary, about nine miles from Saliſbury, in a meadow belonging to Lord Rivers, now in the occupation of Farmer Hayward. This meadow, being ſituated on a ſmall brook, is frequently overflowed, and ſometimes continues ſo a great part of the winter. It bears the greateſt burthen in a wet ſeaſon.

" When I was there, it was too early in the ſpring to make any particular obſervation on the blade, but the farmer's account is as follows, viz. ' that it generally grows to the height ' of about eighteen inches, and then falls and runs along the ' ground in knots, to the length of ſixteen or eighteen feet, ' but that he has known inſtances of its running to the ' length of twenty-five feet.'

" The meadow contains about two acres and a half. It is mowed twice in a ſeaſon, and the average quantity is about twelve loads (tons) of hay the firſt mowing, and ſix the ſecond; though ſometimes conſiderably more. The tithe of the meadow has been compounded for at nine pounds a year,

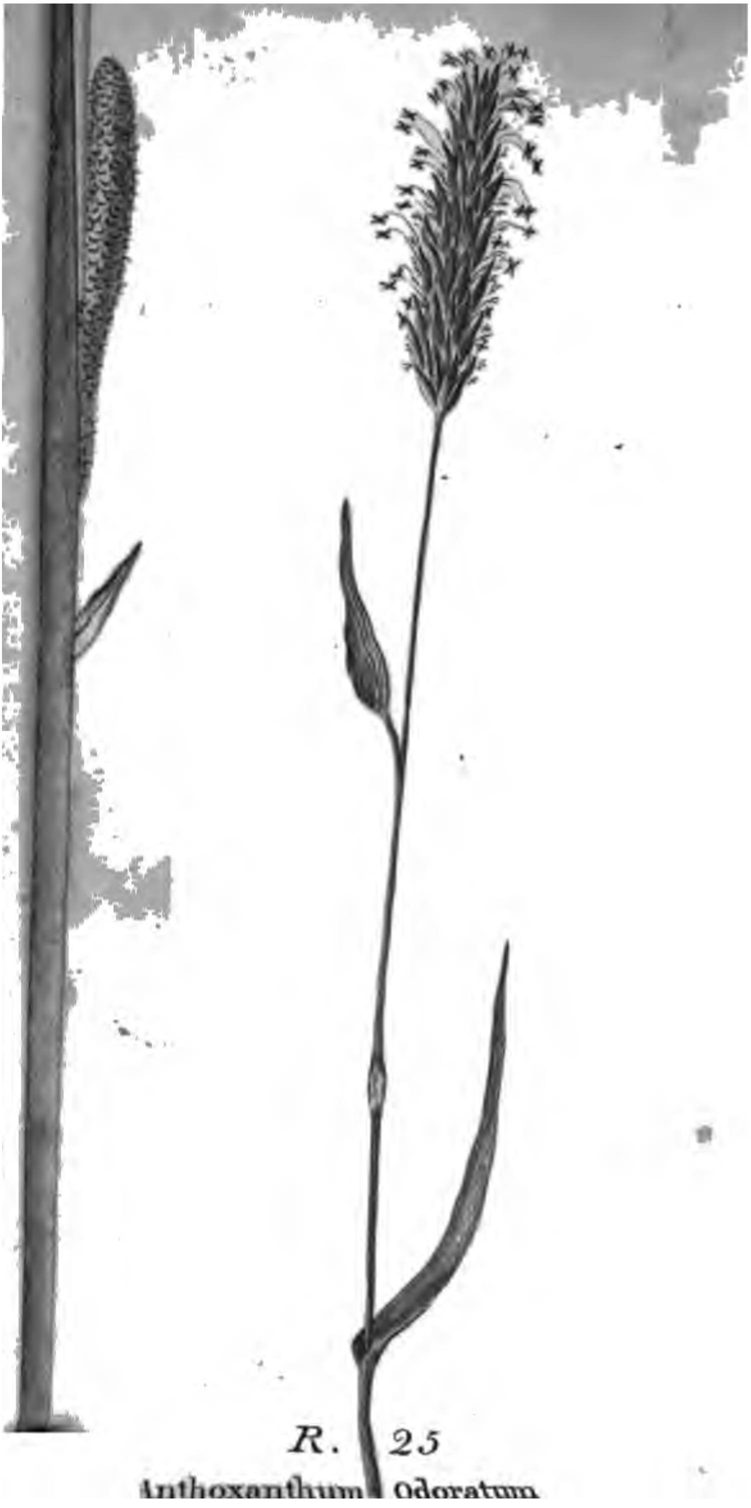
“ The graſs is of a ſweet nature; all cattle, and even
eat it very eagerly. When made into hay it is exce
and improves beaſts greatly. The farmer ſays, his h
will eat it in preference to corn-mixed with chaff, when
are ſet before them together.

“ Some of this graſs was ſent to the Society at Nor
ſome ingenious members of which inform us, that they t
it is a ſpecies of the *Agroſtis Polymorpha* mentioned
Hudſon in his *Flora Anglica*, of which there are ſeveral
rieties.—Camden mentions, in his *Britannia*, a graſs gr
ing near the place where this is found, which he calls *tr*
ing Dog's-grass, and ſays that “ hogs were fed with it.”

[*By Mr.* PRYCE.]

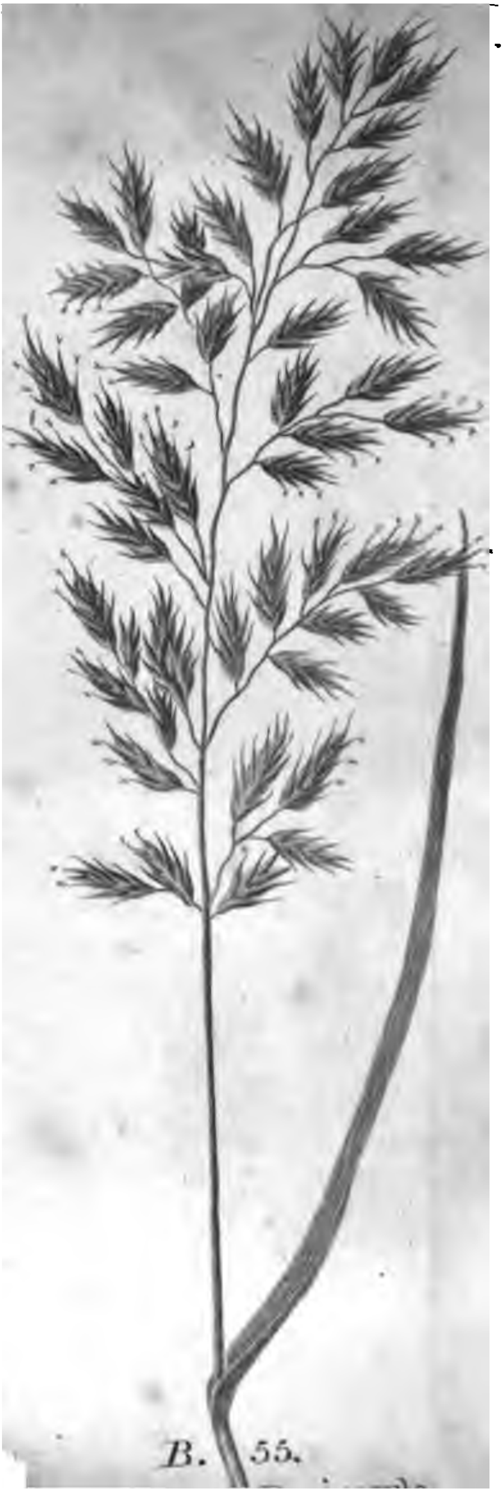
On digging in the moſt fertile ſpot of the field mentio
in the foregoing letter, we found, at the depth of betwee
and 4 inches, a bed of looſe flints, unmixed with ſ
and into which no roots penetrated. A like bed of flints w
found a foot below the ſurface, where the product was
a middle quantity; and in the moſt barren part, we dug
a conſiderable depth, and could find no flints at all.—T
ſoil was alike in each place, a light hazel loam, ſimilar to t
of the adjoining meadows.

This meadow is moſt productive when covered with w
ter the greateſt part of the winter. This would greatly i
jure common water-meadows; the fertility of which d
pends, in a great meaſure, on the water lying on them b
a ſhort time together, and then being laid dry; and it is mo
productive where there is but little depth of ſoil, and the fli
are neareſt the ſurface



R. 25

Anthoxanthum Odoratum



B. 55.

PRINCIPAL ENGLISH GRASSES.

[*By Mr.* SOLE, *of Bath.*]

Uſus	Hud.		
	1.	*Ægilops Incurva,* - - - -	Sea Hard Graſs.
	1.	*Agroſtis ſpica venti* - - -	Silky Bent Graſs.
		Canina, - - - - -	Brown Bent Graſs.
O.	3.α	*Capillaris* - - - -	Fine Bent.
	γ	*Pumila* - - - - -	Dwarf Bent.
	δ	*Stolonifera* - - -	Creeping Bent.
P.	ξ	*Paluſtris* - - - -	Marſh Bent.
P.		*Alba* - - - - - -	White Bent.
	4.	*Minima* - - - -	Dwarf Bent.
T.	1.	*Aira Criſtata* - - - - - -	Creſted Hair Graſs.
	2.	*Cærulea* - - - - - -	Blue Hair Graſs.
	3.	*Aquatica* - - - - -	Water Hair Graſs.
	4.	*Cæſpitoſa* - - - - -	Furzy Hair Graſs.
S.	5.	*Flexuoſa* - - - - -	Purple Hair Graſs.
	6.	*Montana* - - - - -	Mountain Hair Graſs.
	7.	*Caneſcens* - - - - -	Grey Hair Graſs.
	8.	*Præcox* - - - - - -	Early Hair Graſs.
	9.	*Caryophyllea* - - -	Silver Hair Graſs.
E.	1.	*Alopecurus Pratenſis* - -	Meadow Fox-Tail Graſs.
	2.	*Agreſtis* - - -	Fox-Tail of the Corn Fields.
Q.	3.	*Geniculatus* - -	Floating Fox-Tail.
	β	*Bulboſus* - - -	Bulbous Fox-Tail.
	4.α	*Monſpelienſis* -	Sand Fox-Tail.
	5.	*Ventricoſus* - -	Panic Fox-Tail.
R.	1.	*Anthoxanthum Odoratum*	Sweet Spring-Graſs.
	1.	*Arundo Phragmites* - - -	Common-Reed.
	2.	*Calamagroſtis* - -	Hedge-Reed.
	3.	*Epigeios* - - - -	Small-Reed.
	4.	*Arundo Arenaria* - - -	Sea-Reed.
	1.	*Avena Nuda* - - - - -	Naked Oats, or Pillars.

Uſus	Hud.		
	2.	*Fatua*	Wild-Oats.
W.	3.	*Pratenſis*	Meadow Oat-Graſs.
	4.	*Pubeſcens*	Hairy Oat-Graſs.
U.	5.	*Flaveſcens*	Yellow Oat-Graſs.
X.	6.	*Elatior*	Tail Oat-Graſs.
	1.	*Briza Media*	Common Quaking-Graſs.
	2.	*Minor*	Leas Quaking-Graſs. [Ry
	1.γ	*Bromus Secalinus*	Brome-Graſs, with ſeed lik
	2.	*Squarroſis*	Strutting Brome-Graſs.
	3.	*Erectus*	Upright Brome-Graſs.
	β	*Arvenſis*	Corn Brome-Graſs.
	4.	*Muralis*	Wall Brome-Graſs.
	5.	*Sterilis*	Barren Brome; or Brome Barren places.
	6.	*Giganteus*	Tall Brome Graſs.
	7.	*Nemoralis*	Wood Brome-Graſs.
		Hirſutus S.	Rough Brome-Graſs.
L.	1.	*Cynoſurus Criſtatus*	Creſted Dog's-Tail Graſs.
	2.	*Echinatus*	Rough Dog's-Tail Graſs.
	3.	*Cœruleus*	Blue Dog's-Tail.
	1.	*Dactylis Cynoſuroides*	Smooth Cock's-Foot Graſs.
	2.	*Glomeratus*	Rough Cock's-Foot.
	1.	*Elymus Arenarius*	Sea Lyme-Graſs.
F.	1.	*Feſtuca Ovina Vulgaris Tenuis, S.*	Sheep's-Feſcue.
	β	*Vivipara*	Viviparous Feſcue.
B.	2.	*Duriuſcula*	Hardiſh Feſcue-Graſs.
		Filiformis Maritima S.	Fine-leaved Hard-Feſcue.*
	3.	*Rubra*	Reddiſh Feſcue.
	4.	*Cambrica*	Welſh Feſcue.
	5.	*Bromoides*	Brome-like Feſcue.
	6.	*Myurus*	Capon's-Tail Graſs.
E.	7.	*Feſtuca Fluitans*	Flote-Feſcue.
	β	*Loliacea*	Spiked-Feſcue.
C.	γ	*Pratenſis*	Meadow-Feſcue.

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* There is another ſpecies called *Feſtuca Duriuſcula Maritima.*

Uſus	Hud.		
	8.	*Feſtuca Elatior* - - - - -	Tall-Feſcue.
	9.	*Decumbens* - - -	Heath-Feſcue.
	10.	*Pinnata* - - - -	Spiked Wood-Feſcue.
	β	*Sylvatica* - - - -	Wood-Feſcue.
	1.	*Holcus Lanatus* - - - - -	Meadow Soft Graſs.
	2.	*Mollis* - - - - - -	Couchy Soft Graſs.
	1.	*Hordeum Murinum* - - -	Wall Barley-Graſs.
	2.	*Pratenſe* - - - -	Meadow Barley-Graſs.
	3.	*Marinum* - - -	Sea Barley-Graſs.
	4.	*Sylvaticum* - - -	Wood Barley-Graſs.
D.	1.	*Lolium Perenne* - - - - -	Ray-Graſs.
	δ	*Paniculatum* - -	Paniculated Ray-Graſs.
	2.	*Temulentum* - - -	Darnel-Graſs.
N.	3.	*Bromoides* - - - -	Brome-like Ray-Graſs.
	1.	*Melica Nutans* - - - - -	Wood Honey-Graſs.
	2.	*Montana* - - - -	Mountain Honey-Graſs.
	1.	*Melium Effuſum* - - - -	Wild Millet-Graſs.
	1.	*Nardus Stricta* - - - - -	Heath Mat-Graſs.
	1.	*Penicum Virida* - - - -	Green Panic-Graſs.
	2.	*Verticilatum* -	Rough-Panic,
	3.	*Cruſgalli* - - -	Looſe-Panic.
	4.	*Sanguinale* - - -	Cock's-Foot Panic.
	5.	*Dactylon* - - - -	Creeping-Panic.
	1.	*Phalaris Canarienſis* - -	Manured-Canary.
	2.	*Arenaria* - - -	Sea-Canary.
	3.	*Arundinacea* -	Reed-Canary.
Z.	1.	*Phleum Pratenſe* - - - -	Meadow Cat's-Tail.
M.	γ	*Nodoſum* - - - -	Knotty Cat's-Tail.
	2.	*Paniculatum* - -	Branched Cat's-Tail.
M.	1.	*Poa Aquatica* - - - - - -	Reed Meadow-Graſs.
A.	2.	*Pratenſis* - - - - - -	Great Meadow-Graſs.
G.	3.	*Poa Trivialis* - - - - - -	Common Meadow-Graſs.
H.	β	*Paluſtris* - - - - - -	Marſh Meadow-Graſs.
II.		*Prolonga S.* - - -	Long Graſs of Maddington, on Saliſbury-Plain.

Uſus	Hud.		
J.	4.	*Poa Anguſtifolia* - - -	Narrow-leaved Meadow-Graſs.
	5.	*Bulboſa et Setacea* -	Bulbous Meadow-Graſs, and Fine Meadow-Graſs.
K.	6.	*Compreſſa* - - - -	Compreſſed Meadow-Graſs.
Y.	7.	*Annua* - - - - - -	White-Meadow, or Suffolk Gr.
	8.	*Maritima* - - - -	Sea Meadow-Graſs.
I.	9.	*Rigida* *Diſtans* - - - -	Hard Meadow-Graſs.
	10.	*Loliacea* - - - - -	Sea Hard Meadow-Graſs, Fen Meadow-Graſs.
	1.	*Stipa Pennata* - - - - -	Feather-Graſs.
	1.	*Triticum Repens* - - -	Couch, or Dog's-Graſs.
	2.	*Caninum* - -	Bearded Dog's-Graſs.
	3.	*Junceum* - -	Sea Couch-Graſs.

Explanation of the above Scheme.

Uſus.—The column denominated *uſus* ſhews what graſſes are uſeful in agriculture; and the rank of honour which each graſs is entitled to, is denoted by *Italick* capitals in alphabetical gradation. For inſtance, if it be required to know in a minute which is the nobleſt of all the graſſes, look for *A.* Poa Pratenſis. For the worſt of thoſe fit for cultivation, ſee *Z.* Phleum Pratenſe; and ſo of the reſt. Thoſe marked with *Roman* capitals, denote ſuch graſſes as hold an equal rank in goodneſs with their correſpondent italick capitals; but are unfit for cultivation on any ground, but what is frequently under water, being fen-graſſes. And thoſe which have *no* capitals prefixed to them, are to be underſtood as trivial or uſeleſs.

Hud.—The column denominated *Hud.* denotes what graſs it is of Mr. HUDSON, in his admirable work, the *Flora Anglica*, 2d edition. For inſtance, 3. Agroſtis Capillaris, means that it is the 3d Agroſtis of his Flora. And γ Agroſtis Pumila, that it is the third variety of Agroſtis Capillaris, which he has, with great propriety, ſtiled *Polymorpha;* for I have obſerved that none of the ſeeds of any of his varieties under Polymorpha come up like the parent plant; for the ſeed of Agroſtis Alba came up and blowed, ſome like Stolonifera, and ſome like Capillaris; and ſeed of the Paluſtris came up and blowed like Alba and Stolonifera.

The *Flote Feſcue-Graſs* is a moſt excellent graſs, and what cattle are ſo fond of, as often to endanger their lives in getting at it; as it always chooſes water with a miry bottom to grow in, therefore cannot be cultivated. It is to this graſs we are indebted for our fine Cottenham cheeſe; the land all round Cottenham, in Cambridgeſhire, abounding with this graſs. Mere and Cheddar cheeſes alſo owe their fame in a great meaſure to this graſs. This is the Maddington long graſs of Mr. Stillingfleet. It grows plentifully in the moors under Cheddar, Glaſton, Mere, &c. we have it in ditches and ponds about Bathwick and Lyncombe, &c.—See Nos. 7, 96, 97.

The *Meadow Feſcue-Graſs* is a very excellent graſs for cultivation, and yields to none, but *Poa Pratenſis*, for merit; being ſweet, luxuriant, and very quick in its growth; affording rich paſture, and making good hay. It abounds in the rich meadows about Melkſham, Laycock, and Chippenham.

Ray-Graſs is an excellent graſs, both for paſture and hay, all ſorts of cattle being fond of it. Clean hay of this graſs is particularly preferable for race-horſes and hunters, for it does not affect their wind, and blow them, as other hay does; and notwithſtanding it runs all to bents, yet the juice is ſo concentrated in them, as to afford greater nouriſhment to a horſe than twice its quantity of common hay.

The *Reed Meadow-Graſs*, in its native ſoil, the fens of the iſle of Ely, grows to the height of ſix feet. It is uſually cut when about four feet high; when dry, they bind it in ſheaves; it generally undergoes a heat in the rick, which improves it. It is excellent fodder for milch-cows—horſes are not fond of it. The inhabitants there call it *fodder*, by way of eminence; other kinds of coarſe hay being called *ſtover*, i. e. *coarſe ſtuff*; it is alſo called *white-lead*, drying of a white colour.

The *Great Meadow-Graſs* is the moſt noble of all the graſſes, agriculturally conſidered. Every thing that eats graſs is fond of it; it makes the very beſt hay, and affords the richeſt paſture. All our beſt meadows abound with it, particularly about Laycock and Chippenham. It moreover has this good qualification, of abiding in the ſame ground everlaſtingly; whereas moſt other graſſes are for ever changing places.

The *Common Meadow-Graſs* is a fine graſs, both for paſture and hay, yet very inferior to the *Poa Pratenſis*, being apt to go off after mowing, and ſuffer itſelf to be ſupplanted by *Agroſtis Repens*, a much inferior graſs ſtill; but manure and feeding keep this graſs in vigour, and prevent the piratical depredations of *Agroſtis*.

The *Long-Graſs of Maddington, on Saliſbury-Plain*, whoſe fame is ſpread all over England, needs no eulogium here; but as it is differently deſcribed by different authors, who all name different graſſes, I ſhall give my opinion of it. Farmer John Hooper, who now occupies the ground, accompanied me to the field, and gathered thoſe ſpecimens here inſerted, which are nothing more or leſs than *trivialis*; and I am convinced, it is the ground itſelf, and not the kind of graſs, which conſtitutes the vaſt product talked of. The ſoil itſelf reſembles, as deep as I could penetrate with a long knife, (viz. eight inches) an old muſhroom bed; and the noted graſs, ſo much talked of, conſiſts of four ſorts; and is not a peculiar graſs, as generally ſuppoſed.

The four predominant graſſes above alluded to are as follow:—Firſt, of this, which is the principal; and 2dly, of *Flote-Feſcue*; 3dly, *Common Couch*, whoſe root thrives prodigiouſly in this looſe rich ſoil, and which, perhaps, is the cauſe of its fattening hogs, which no other field has the property of doing; and 4thly, of *Agroſtis Paluſtris*. Theſe four different graſſes blow in four different months, which I take to be the reaſon of every author deſcribing a different graſs; for he who goes in May finds this *Poa* in bloom; he in June, *Flote-Feſcue*; he in July, *Couch-Graſs*; and he who goes at Michaelmas finds *Agroſtris Paluſtris.*

This ground being over-run by ſtreams of water from the ſtreet, farm-yards, &c. upon every downfall of rain, it is rendered ſo prolific as to bear four crops a year; and by the courſe of the water the graſs is kept couchant, and in that ſpongy ſoil ſtrikes at the joints, ſo that it will creep a vaſt length ſome wet years. This laſt May (1789) being very dry, it did not begin to creep before my viſit: theſe being the beſt ſpecimens Mr. Hooper and I could find; but eight years ago I procured ſpecimens, ſix and eight feet in length, of *Poa Trivialis.*

[*By Rev. Mr. Swayne*; *Sept.* 15, 1781.]

The parcels which accompany this contain a quantity of the fine *Bent Graſs* ſeed in the blade, and a little of the *Creſted Dog's-tail*; which, with what I have before tranſmitted to you, complete a ſmall collection of the graſs ſeeds, for which a premium has been offered by the Society for theſe three years paſt.

I remarked thoſe particular fields and meadows where each ſort grew in the greateſt abundance. I picked ſpecimens of each when in full bloom, and carefully compared them (being myelf but a novice in Botany) with the deſcriptions of the graſſes given in Dr. WITHERING's Botanical Arrangement. I examined them in their growth from time to time, and, when ripe, attended to the gathering them with unremitting application.

The *Annual Poa* drops its ſeeds before they are dry, and to appearance before they are ripe. The utmoſt care is therefore neceſſary in gathering the blades, without which very few of the ſeeds will be ſaved. It ripens from the middle of April to ſo late, I believe, as the end of October; but moſtly diſappears in the middle of the ſummer.

The *Vernal* is difficult to collect, owing to its being ſurrounded with taller graſſes at the time of its ripening, and being almoſt hid among them. It was found moſtly in the moiſt parts of meadows; very little of it on dry paſtures. It flowers about the beginning of May; and is ripe about the middle of June.

The *Meadow Foxtail* occurs in moſt meadows, particularly near hedges. It flowers ſomewhat later than the *Vernal*, and is ripe the latter end of June.

The *Flote Fescue* is found only in pools, wet ditches, and other very ſpringy places. Its ſeeds drop off with the leaſt touch, before they are nearly dry. It flowers the latter end of May; and is ripe in June.

The *Great Poa* affects chiefly the dry parts of meadows; though it is to be found on moſt good paſtures. It is more retentive of its ſeeds than either of the graſſes I have met with; it may therefore be ſuffered to remain till the ſtalks are quite dry. It bloſſoms the beginning of June, and its ſeeds are ripe in July.

The *Common Poa*; this I ſhould rather call the *Great Poa*, the flowering ſtalks being of a much taller growth than the former; but this the Linnæan ſyſtem forbids. I have obſerved this graſs to grow in great abundance, even to the excluſion of almoſt all other kinds, in thoſe places in meadows over which the water has been conſtantly flowing the whole winter. It flowers the beginning of June, though ſometimes later than the former, and ripens the beginning of July.

The *Sheep's Fescue* I apprehend to be the moſt valuable graſs of all. It was obſerved to grow and thrive on lands of all qualities and in all ſituations, from the drieſt upland paſtures to the very moiſt parts of meadows. It flowers in June, and is ripe in July.

The *Meadow Fescue* was found univerſally in meadows and rich paſtures; it is rather a coarſe graſs. It flowers in June, and is ripe in July.

The *Yellow Oat* abounds chiefly in dry paſtures. It flowers in June, and is ripe in July.

The *Creſted Dog's Tail* is a very common graſs, affecting rather dry land; and is the eaſieſt of the whole group to collect a quantity of ſeed from. It flowers in June, and is ripe in July.

The *Fine Bent* flowers and ripens its ſeed the lateſt of them all. It appears to be fond of moiſt ground. It retains its ſeed till full ripe, flowers the latter end of July, and is ripe the latter end of Auguſt.

Sundry Hints by different Correspondents.

IN the year 1740, the Sieur De la Revere, at Paris, obtained a patent for making flannels, velvets, and other ſtuffs, of the cottony down of the *Apocynum*, or Dog's-bane. When I was in France about the year 1767, I ſaw ſome of this manufacture, and found that it anſwered very well, eſpecially when a little wool was mixed with it before ſpinning. I alſo found that this cotton had long been highly eſteemed there for ſtuffing eaſy chairs, ſettees, and ſtools; and alſo for quilts, which rendered them very light and warm, the down being very elaſtick. The great quantities of this down or cotton which our hedge-rows produce every autumn, might be applied to ſome ſuch uſes in this country, as it appears to be of the ſame kind as that uſed in France. W. I.

I am of opinion that crops of graſſes, as well as grain, might be much improved, and the quantity conſiderably increaſed, by a change of ſoil and ſituation, or (in other words) by changing the ſeed. I ſome years ſince ſowed a ſmall field with marl graſs-ſeed, which I procured from a gentleman in Kent, and the crop was much ſuperior to that of another field ſown with the ſame kind of graſs which had been raiſed in the neighbourhood; although the ſoil, and the quantity of ſeed ſown per acre were the ſame. J. W.

The following compoſition being an excellent colouring for pales, gates, rails, barns, and other outhouſe doors, &c. I take the liberty of recommending it to your Society in particular, and to the public in general:—Melt twelve ounces of reſin in an iron pot or kettle; add three gallons of train oil, and three or four rolls of brimſtone; and when the reſin and brimſtone are melted and become thin, add as much Spaniſh brown, or red or yellow oker, (or any other colour you want) firſt ground fine with ſome of the oil, as will give the whole as deep a ſhade as you like. Then lay it on with a bruſh as hot and thin as you can. Some days after the firſt coat is dried, give it a ſecond. It will preſerve plank for ages, and keep the weather from driving through brick-work. W. T.

As a proof of the ſurpriſing advantages that attend the planting or ſowing wheat in drills, and the immenſe ſaving of ſeed by that method, I beg leave to mention the following inſtance, which fell within my own obſervation:—Some years ſince, Mr. Wheatly, of Morden, in the county of Cambridge, planted an acre of land with wheat, leaving a foot ſpace between every two kernels; the whole acre took up half a peck and one pint of ſeed, and the produce was thirty-nine buſhels. R. M.

To a quart of turnip-ſeed add one ounce of brimſtone finely powdered, putting both into a bottle large enough to afford room to ſhake them well together every day for four or five days previous to ſowing; keep the bottle well corked. This has by long experience been proved never to fail in preſerving ſeedling turnips from the fly. G. K.

Monſieur de Broſſes, firſt Preſident of the Parliament of Dijon in France, finding that the inſects called Weevils had got among ſome wheat at one of his farms, tried almoſt every method to get rid of them, but in vain, for his granaries ſtill continued infeſted with this voracious inſect. At length, being informed of a method to deſtroy them, which was quite ſimple, and not expenſive, and which had been practiſed with ſucceſs in the province of Poictou, he ſet about it in the following manner:—He got ſome live lobſters, which he threw on the wheat that was infeſted, and in four hours time the weevils came out from all parts, diſperſing themſelves over the walls in ſuch numbers, that in many places they were quite black with them; and by this means they were eaſily deſtroyed.——The ſmell of lobſters, particularly if left till they ſtink, always proves fatal to theſe inſects, and yet will not in the leaſt affect the corn. This remedy ſhould be uſed as ſoon as the weevils appear, or begin to make neſts.

On laying down Fields to Grass; the Kinds of Grasses most valuable, &c.

THE latter end of Auguſt, or the beginning of September, is the beſt ſeaſon for ſowing graſs-ſeeds, as there is time for the roots of the young plants to fix themſelves before the ſharp froſts ſet in; but if this ſeaſon prove unfavourable, they will do very well the middle of March following.——If you would have fine paſture, never ſow on foul land. Before ſowing, lay the land as level and fine as poſſible. If your graſs-ſeeds are clean, (which ſhould always be the caſe) three buſhels will be ſufficient per acre. When ſown, harrow it in gently, and roll it with a wooden roller. When it comes up, fill up all the bare ſpots by freſh ſeed, which, if rolled to fix it, will ſoon come up, and overtake the reſt.——In Norfolk they ſow clover with their graſſes, particularly with ray-graſs; but this ſhould not be done, except when the land is deſigned for graſs only three or four years, becauſe neither of theſe kinds will laſt long in the land. Where it is intended for a continuance, it is better to mix only ſmall white Dutch clover, or marle-graſs, with your other graſs feed, and not more than eight pounds to an acre. Theſe are abiding plants, ſpread cloſe on the ſurface, and make the ſweeteſt feed of any for cattle.

[*By* J. B. *of S—d, Essex.*]

A neighbour of mine underdrained a cold wet piece of land, and laid on it turf-earth digged from the borders of fields and highways, mixed with ſtable-dung. In March he gave it a good ploughing, and ſowed it with Zealand barley; after the barley came up, he threw in ten pounds of the

:ommon red clover per acre. The advantage of the under-lraining and manure were ſoon apparent. The barley was an exceeding fine crop, producing ſeven quarters per acre on an average throughout the field. The following ſpring the clover ſhot early, and in the ſummer proved a very ſtrong crop. In May he turned in all his cattle, which by the 10th of June had fed it off quite bare; he then took them out, and let the clover ſtand for ſeed. The ſummer proving wet, it ſucceeded well, and the average produce of the field was ſeven buſhels and a half per acre, the whole of which he ſold at 39s. per buſhel—amounting to 555l. 15s.

[*By Mr.* CURTIS.]

Cow-Clover, or Cow-Graſs, are (I doubt not) the ſame plant; but Cow-Wheat belongs to a very different genus—the *Melampyrus* of Linnæus. There are, growing wild in this country, two ſpecies of clover, much reſembling each other in ſize, and in the colour of their bloſſoms; the one is the *Trefolium Pratense*, the other the *Trefolium Alpeſtre* of Linnæus. The former is the common broad-leaved clover; the latter, the long-leaved, or creeping-rooted clover; for it differs from the common-broad-leaved kind, not only in having longer and narrower leaves, but alſo in having a root not only perennial, but creeping. I know with certainty that the ſeed of the broad-leaved clover is ſold in the London ſhops for the true Cow-graſs; yet I have often ſuſpected that the different name of Cow-graſs might originally have been given to the long-leaved ſort, from its poſſeſſing ſome qualities ſuperior to the other; and its ſeed not having been collected, the other has ſupplied its place. The ſeeds of the Cow-wheat are not to be had in any of the London ſhops.

[*By Mr.* WAGSTAFF.]

I conceive that Cow-Graſs, and Cow-Clover, have no ſpecifick diſtinction. All the graſſes and trefoils [*Trefolia*] are almoſt indiſcriminately cropped in a certain ſtate of vegetation by every neat beaſt. Theſe diſtinctions muſt therefore be arbitrary or local; as the *Briza*, or Quaking-Graſs, is in ſome counties called the Cow-Quake.

With reſpect to Cow-Wheat, it is unqueſtionably the the *Melampyrum Arvenſe*, (purple Cow-Wheat) and has no affinity with either clover or graſs; but is a good food for cattle, and as ſuch it has been divers times recommended as a ſubject proper for cultivation. It is a ſcarce plant, large, and bearing a ſpike of purple flowers, with numerous floral leaves of the ſame colour. Its ſeeds when ripe have a near reſemblance to wheat, from which circumſtance, no doubt, it obtained its name.

[*By Mr.* SPOONER.]

The Guinea and Scotch graſſes, produced in the Weſt-Indies, are of ſuch great utility, that the preſervation of the ſtock there frequently depends upon them.——The *Guinea graſs* appears capable of thriving in any ſituation, in reſpect to climate and ſoil, and can bear the effects of dry or wet weather in a moſt remarkable manner. In wet weather it grows ſo faſt, that it may be cut once in a fortnight, and ſometimes oftener, when the land which yields it is new or fertile. In dry, it is a long time before it withers, and, when reduced thereby to ſuch a ſtate as to ſeem totally deſtroyed, will revive with a ſlight ſhower in a very few hours; and when rain falls, though in ſo ſparing a degree as to be of little or no ſervice to common paſtures, it will occaſion this to vegetate, and to be fit for uſe in a few weeks; nay, in ſome ſituations, not too much expoſed to the heat of the ſun, it is known to flouriſh, and derive ample ſupport, from occaſional dews only. It has, further, ſo peculiar a quality of ſtocking, that with very little care in its infancy it will overcome all other graſs and weeds; and in ground full of ſtones and rocks, though planted at very great diſtances, at random, as the appearance of the ſoil admits, will ſpread itſelf about them in a few months, and at laſt cover them entirely. This graſs, when ready to feed, is from ſix to eight feet high; but it is generally fed upon, or cut, when only three or four. It agrees with all kinds of ſtock; and horſes, mules, and cattle, when turned out to feed upon it, will fatten ſo faſt, that the two former will be in good condition in a couple of months, or leſs; and the latter will become fit for the butcher in the courſe of three months.

The cultivation of this graſs is very eaſy, and attended but with little care, expence, or trouble. It is not immediately produced from the ſeed, but is previouſly planted. The land intended for it is generally made perfectly bare by hoeing, and holes are then dug thereon, from three to five feet diſtance, varying in this reſpect according to the quality of the ſoil; that is, if it be rich, the holes are to be made at a greater, and if poor, at a leſs diſtance. The months moſt approved of for planting are April and May, as the graſs will then feed in September and October, at which periods it is found to feed by far the moſt abundantly. The blades of this graſs, when flouriſhing, appear not unlike thoſe of wheat, only rather broader and longer; and the ſtalks, during the firſt growth, are alſo much like thoſe of it, but they get weaker and leſs, the oftener the graſs is fed upon or cut, till at laſt it becomes a fine, rich, and entire ſwarth.

The Scotch graſs is chiefly produced in low marſhy lands, that have a running ſtream or river through them, and can be eaſily overflowed when dry weather would affect it. It is generally cut for uſe, and given to the ſtock; and in good ſeaſons, that is, if light ſhowers now and then aſſiſt, will admit of cutting once a week or oftener. The blades of this graſs are longer, broader, thicker, and of a darker green than the Guinea graſs; and the ſtalks much larger, and more juicy and pithy. It is an excellent food for horſes, mules, and cattle; but is not made uſe of, and, perhaps, is not ſo well calculated for ſheep, or to fatten cattle, as the Guinea graſs.

This graſs is alſo cultivated by being planted, which is thus accompliſhed:—The land is freed from all weeds, ſedges, and rubbiſh, by their being clean hoed, and burnt off, and requires to be laid out ſo as to admit of being overflowed; and alſo to be ſo well drained that no water can lodge to ſtagnate, and deſtroy the graſs. The graſs to be planted is cut into junks, every joint thereof, which is from five to ten inches long, being a junk, or plant. A ſingle one is ſtuck in the ground with the joint downwards, and in this manner they are diſtributed, at random, ſo as to be about ſix or eight inches apart. In a few hours theſe joints begin to ſhoot, and take root: and in the courſe of three weeks, or a month, the graſs will grow ſufficiently high to be cut, which is when it is about ſix feet.

[*By* W. E. *near Halesworth.*]

In April, after my barley is come up, I ſow about eight pounds of clover ſeed per acre on it, and roll the land.

After the corn is reaped, I omit turning in any cattle till the crop of clover gets up pretty high and thick, which it will generally be by the end of October. I then turn in ſheep and other ſmall cattle for about a month, or, if the crop be large, about ſix weeks. After this time, I let it remain unfed till April. My cattle are then turned in, which eat it off pretty bare by May, at which time I clear it for a crop of hay. If the ſeaſon is not remarkably dry, it will be ready for the firſt cutting by the middle of June, and generally yields me two tons per acre.

The beſt method I ever found to prevent cattle from being hoved, as it is here called, or choaked, on their being turned into green clover, is to let them remain at the firſt no longer than till their bellies are full; and while feeding, to keep them conſtantly ſtirring. Whenever, notwithſtanding this precaution, any of my cattle have ſwelled, I have immediately opened a vein, and ſtabbed them in the flank near enough the hip-bone to prevent wounding the entrails. As ſoon as this was done, I put a quill or reed into the orifice to keep it open, that the wind might have a free paſſage out, and keep the animal warm till it recovered its breath. By this means I never loſt more than one, and that was occaſioned by the remedy being applied to late.

[*By Dr.* ANDERSON.]

The proceſs by which the froſt deſtroys broad clover is very eaſily obſervable on ſpungy moory ſoils, in which water is retained in a ſtate more nearly approaching to fluidity than in others. In rich clayey loams, where the ſame proceſs takes place in an inferior degree, the progreſs is far leſs perceptible. In ſuch ſpongy ſoils I have often remarked the following phenomena:—

After a night of bare froſt, in thoſe places where the earth is not covered with a cloſe ſward of graſs, the ſurface ſeems to be divided into a great number of broad kind of points, divided from each other by a great variety of fiſſures, ſomething like what takes place in a clayey pool, when the water has been ſuddenly evaporated, and the mud haſtily indurated.

On taking up one of theſe detached pieces, and examining it, we diſcover that it conſiſts almoſt entirely of frozen water, with a thin cruſt of earth on its top. The ice in this caſe aſſumes a beautiful and ſingular form, conſiſting of a ſtack of needle-like columns, ſtanding in a vertical poſition, all of one height; a rude ſketch of which is given in the annexed plate A.* The vertical column conſiſts of tranſparent ſpiculæ, ſometimes with a little earth intermixed with them, but uſually pretty free from it. They have always a little earth at top; and when they are taken up, a little earth alſo adheres to their bottom; and below that the froſt has not penetrated. Theſe columns are longer or ſhorter according to circumſtances, from near two inches, as I have ſeen them, to leſs than a quarter of an inch. If the froſt continues more than one night, theſe icy pillars admit of a greater elongation by an additional range of columns ſhooting up below them, and forcing the former to riſe to a greater height. This ſecond ſeries of columns is always ſhorter than the firſt, and is divided from it by a thin ſtratum of earth, as at B.* Should the froſt continue longer, another row of ſhorter columns ſtill is formed beneath the former, divided from it alſo by its ſtratum of earth: and ſo it goes on, each night's froſt producing a new ſet of columns, which becomes gradually ſhorter, till at laſt the different ſtrata of earth which ſeparate them become ſo near to each other, as that the watery columns cannot be diſtinguiſhed; ſo that the baſe appears to be only a lump of frozen earth, to which theſe ſtacks of columns (C. D.) firmly adhere.

When any vegetable is growing on the ſoil thus affected, the top of theſe columns of ice naturally lay hold of it as it were, and adhere to it ſo cloſely as to force it up along with them with a very ſtrong power. If the root penetrates the ground perpendicularly, either the main root muſt be broken off by this force, applied as at E, or the lateral fibres muſt be all torn off from the principal root, ſo as to leave it entirely naked, and thus expoſed to the injuries of the weather, altogether defenceleſs. When a thaw comes, the columns of ice are melted away, and the earth ſubſides to its former bulk, ſo that the poor naked root ſtands up as at F, and muſt infallibly periſh. Every attentive farmer muſt have remarked his broad clover drawn at times out of the ground in this manner; though he has not perhaps adverted to the proceſs above deſcribed, by which it was effected. I have ſometimes ſeen it thus forced out of the ground, on ſoils of the nature above deſcribed, full ſix inches; but in mellow cultivated fields, it ſeldom exceeds one or two inches.

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* See plate No. I.

Spongy ſoils, of the nature above deſcribed, are therefore unfit for producing broad clover; and the nearer they approach to the nature of theſe, the more precarious will that crop be upon them: but nothing of this ſort happens, when the froſt is accompanied by a ſnow to a ſufficient depth.

In ſoils of the nature here deſcribed, it is obſervable, that if the ſurface be covered with fibrous-rooted graſſes, they are not thus thrown out; for as theſe roots are generally numerous, and cloſely interwoven with each other, they form ſuch a cloſe ſurface, that the tops of the icy columns do not appear divided; but the whole ſurface is lifted up with a conſiderable ſtratum of earth, ſo that when the thaw comes, the whole ſurface ſubſides together, and the roots quickly ſtrike into the ſoil below.

This being obviouſly the caſe, if ever reliance be to be had on broad clover for a ſecond year's crop, it is adviſeable to ſow with the clover a proportion of rye-graſs. This is a very profitable practice, as it much augments [illegible] the firſt cutting, and makes it come ſome weeks earlier than otherwiſe it would have been. It alſo effectually prevents the white gowans from appearing, which ſo often render a crop of red clover ſown alone worth very little. And as the clover afterward advances much more quickly than the rye-graſs, the ſucceeding cuttings are as good as if no rye-graſs had been ſown.

The rule I have ever followed to guard againſt every accident, is, to ſow along with the red clover a conſiderable proportion of the white or Dutch clover, and ſome graſs. If the broad clover flouriſhes, theſe do not retard its growth, and only tend to thicken it; and if it ſhould fail, which it ſometimes will do in ſpite of every precaution, theſe plants fill the ground, and produce an abundant crop of herbage, which affords a greater weight and finer hay, than broad clover alone: though they do not anſwer quite ſo well for cutting for green forage.——*Dec.* 9, 1786.

[*By Mr.* WICKINS, *Pondhead, near Lindhurst.*]

I have, during the laſt three years, with ſome probability of ſucceſs, been aiming at the *perpetuating of Clover Crops*, under the following ſyſtem:—

In the month of October I carry on and ſpread over my recent clover grounds a good top-dreſſing of dung, aſhes, &c.; this I ſuffer to lie in a looſe eaſy ſtate during the winter, which ſhelters and invigorates the plant, and the better enables it to withſtand the wet and froſt. The beginning of April following I ſprinkle over the whole of the ground freſh and good ſeed, at the rate of ſix pounds to the acre, with about half a buſhel of rye-graſs, (if wanted.) I then run my fine dreſſing-harrows over it every way, which ſerves as an hoeing and cleaning to the former plants—diſtributes the top-dreſſing—admits the ſun, air, and water to their roots—and depoſits the freſh ſeed ſufficiently deep for vegetation, by the preſſure of a heavy roller over the ſurface.——Hence will ariſe an annual ſucceſſion of freſh plants, and the objection to the *inſtability* of the clover crop will, in ſome meaſure, be obviated.——*Oct.* 24, 1798.

[*By* H. D. *of Kent.*]

Burnet is not generally cultivated in this county; but ſome of our moſt intelligent farmers have raiſed it of late years with conſiderable ſucceſs.

The cultivation of this graſs is attended with one principal advantage, beſides that of not requiring a rich ſoil; which is, that it proves an excellent winter paſture, when hardly any thing elſe vegetates.

The cultivation of it is neither hazardous nor expenſive. If the land be prepared as is generally done for turnips, there is no danger of its failing. After the firſt year, it will be attended with very little expence, as the flat circular ſpread of its leaves will keep down, or prevent the growth of weeds.

On the failure of turnips, either from the fly or the black worm, ſome of our farmers have ſown the land with Burnet, and in March following had a fine paſture for ſheep & lambs.

It will perfect its ſeed twice in a ſummer; and this ſeed is ſaid to be as good as oats for horſes; but it is too valuable to be applied to that uſe. After it is fed down with cattle, it ſhould be harrowed clean. Some horſes will not eat it freely at firſt, but in a few days they are generally very fond of it. It affords rich pleaſant milk, and in great plenty.

The ſevereſt froſt never injures this plant; and the oftener it is fed the thicker are its leaves, which ſpring conſtantly from its root.——*Jan.* 15, 1783.

A Lover of Georgical Purſuits ſays, upon trial Burnet will be found to go further in feeding ſheep than any other plant. Thus, ſuppoſe that ſome ſheep are fed on an acre of it, and an equal number on an acre of any other plant; I have ſome authority to ſay, that ſheep will be longer well fed on burnet than any other plant I know. The mutton of ſheep fed on it will be better coloured, more juicy, and better flavoured, than the mutton fed on any other food. It ſtands the winter better, and ſhoots as early in ſpring as any plant. It has been found to be a perfect cure of the rot in ſheep; and cows, ſheep, or goats, fed on it, give more nouriſhing milk than on any other paſture; and the butter obtained from their milk is not inferior to any.---I have mentioned ſheep particularly, becauſe burnet ſeems to be more peculiarly beneficial to them than to cattle.

[*By* J. B. *of Saffron-Waldron.*]

As the roots of ſainfoin ſtrike deep in our chalky ſoil, this plant is not liable to be ſo much injured by drought as other graſſes, whoſe fibres ſhoot horizontally, and lie near the ſurface. The quantity of hay produced is greater and better in quality than any other. But there is one advantage attending this graſs, which renders it ſuperior to any other; and that ariſes from feeding it with milch-cows. The prodigious increaſe of milk which it makes is aſtoniſhing, being nearly double that produced by any other green food. The milk is alſo better, and yields more cream than any other.

[*By an Essex Farmer.*]

Sainfoin will always ſucceed well where the roots run deep; the worſt ſoil of all for it is where there is a bed of cold wet clay, which the tender fibres cannot penetrate.

This plant will make a greater increaſe of produce, by at leaſt thirty times, than common graſs or turf on poor land. Where it meets with chalk or ſtone, it will extend its roots through the cracks and chinks to a very great depth, in ſearch of nouriſhment. The dryneſs is of more conſequence than the richneſs of land for ſainfoin; although land that is both dry and rich will always produce the largeſt crops.

It is very commonly ſown broadcaſt, but it is found to anſwer beſt in drills, eſpecially if the land be made fine by repeated ploughing, rolling, and harrowing. Much depends on the depth which this ſeed is ſown. If it be buried more than an inch deep, it will ſeldom grow; and if left uncovered, it will puſh out its roots above ground, and theſe will be killed by the air. March and the beginning of April are the beſt ſeaſons for ſowing it, as the ſeverity of winter and the drought of ſummer are equally unfavourable to the young plants. A buſhel of ſeed ſown broadcaſt, or half that quantity in drills, if good, is ſufficient for an acre. The drills ſhould be thirty inches apart, to admit of horſe-hoeing between them. Much, however, depends on the goodneſs of the ſeed. A ſmall quantity of ſoaper's aſhes, as a top-dreſſing, will be of great ſervice, if laid on the firſt winter.

The beſt time of cutting the ſeeded ſainfoin is when the greateſt part of the ſeed is well filled, the firſt-blown ripe, and the laſt-blown beginning to open. For want of this care ſome people have loſt most of their ſeed by letting it ſtand too ripe. Seeded ſainfoin ſhould always be cut in a morning or evening, when the dews render the ſtalks tender. If cut when the ſun ſhines hot, much of the ſeed will fall out and be loſt.——If the ſoil be tolerably good, a field of ſainfoin will laſt from fifteen to twenty years in prime; but at the end of ſeven or eight years it will be neceſſary to lay on a moderate coat of well-rotted dung; or, if the ſoil be very light and ſandy, of marle. By this means the future crops, and the duration of the plants in health and vigour, will be greatly increaſed and prolonged. Hence it will appear, that for poor land there is nothing equal to this graſs in point of advantage to the farmer.——*March* 1781.

[*By the Rev. Mr.* Close.]

April 30th, 1782, I ſowed half a pound of lucern in a ſeed bed, the drills being drawn with a garden hoe, at ſix inches diſtance, and covered with a rake. September 24th following, I took up the plants, cut the tap-roots off, leaving each root about three inches long, and tranſplanted them into a piece of good mixed ſoil land, containing 2 roods 16 rods, leaving room for ploughing the intervals, as it was planted two feet two inches from row to row, and ten inches from plant to plant in each row.——In the year 1783 it yielded four crops, which were cut and given to the horſes in the yards, the weight of which cannot be aſcertained; but in the year 1784 I had it all weighed, and kept an account of the produce, which amounted in the whole to 8 tons, 2 hundreds, and 41 pounds of green food, from ſomewhat more than half an acre.

[*By a Gentleman Farmer in Herts.*]

Lucerne merits every poſſible encouragement. Some years ſince I divided a field of two acres into four parts, and ſowed it with lucerne, in the following manner:

1ſt part, drills 3 feet aſunder. 3d part, drills 1 foot ditto.
2d part, drills 2 feet ditto. 4th part, broadcaſt.

The ſoil was equal throughout the field. The ſeed was ſown on the 24th of April; on the 16th of Auguſt I cut the whole field, and weighed the produce of each part ſeparately. That ſown in three-feet drills produced only about half the weight of that ſown broadcaſt; and the reſt in proportion, leſſening as the width of the rows increaſed.

In the fourth year, the produce of the three-feet drills was more than double the broadcaſt; and being adapted to the horſe-hoe, were kept free from weeds, and earthed up at a ſmall expence in compariſon of the other.

Weeds are the greateſt enemy to lucerne; and the eaſieſt and cheapeſt way of keeping the crop clean, is to ſow it in drills of ſufficient width to admit the horſe-hoe.—*March* 1781.

Historical Account of the Marsh Lands of the County of Somerset.

[*By* Richard Locke, *Esq.*]

THESE lands are ſituated in the different pariſhes of Wedmore, Huntſpill, Burnham, Mark, Eaſt-Brent, and South-Brent, eſtimated in the whole at 31,050 acres; which have riſen from the annual value of one farthing per acre to two pounds five ſhillings. In the year 1086 the rent was one farthing; in 1500, four-pence; in 1600, fifteen-pence; in 1650, half-a-crown; at the Revolution, five ſhillings; in 1745, ten ſhillings; and in 1796, forty-five ſhillings.

As to paſture-land, about one-tenth of it was in its higheſt degree of culture fifty years ſince; and the only difference in agriculture which I have remarked on thoſe lands is in the mode of draining; for when I firſt remember, the gutters were dug two feet wide, and one foot deep; whereas the preſent improved practice is to cut the drain ten inches wide and twenty inches deep. In recurring to my minutes when

I firſt began to meaſure and value land, in 1755, I find the following table, No. 1, calculated for the valuation of paſture, which will diſcover the great advance of eſtates in the courſe of forty years, by comparing it with the preſent valuation as in the table No. 2.

No. I.
Valuation Table in 1755.

Quality of the land.	Price per acre.		
	£.	s.	d.
No. 1	1	5	6
2	1	2	6
3	1	0	0
4	0	17	6
5	0	15	0
6	0	12	6
7	0	10	0
8	0	5	0
9	0	2	6

No. II.
Valuation Table in 1796.

Quality of the land.	Price per acre.		
	£.	s.	d.
No. 1	3	10	0
2	3	5	0
3	3	0	0
4	2	15	0
5	2	10	0
6	2	5	0
7	2	0	0
8	1	15	0
9	1	10	0

	Dates.		Value per acre.				Value per annum.
			£.	s.	d.		£.
A Farm of 100 acres, in	1747	let at	0	10	0	—	50
	1754	—	0	15	0	—	75
	1761	—	1	0	0	—	100
	1768	—	1	5	0	—	125
	1775	—	1	10	0	—	150
	1782	—	1	15	0	—	175
	1789	—	2	0	0	—	200
	1796	—	2	5	0	—	225

I remember when land was let at fifteen ſhillings per acre, to have ſold beef and pork at three ſhillings per ſcore, mutton at two-pence per pound, cheeſe at ſixteen ſhillings per hundred, bacon and butter at three-pence per pound, wheat at three ſhillings per buſhel, barton-fowls and ducks at eight-pence per couple, and fat geeſe at two-pence farthing per pound. Now, ſuppoſing theſe ſeveral articles ſell at preſent at three times that price, why cannot a farmer afford to give three times the rent for his farm, viz. forty-five ſhillings per acre, upon an average? And if ſo, how far ſhort that is of three pound ten ſhillings per acre for the beſt land, I leave to the judgment of the occupier; who very well knows the expence of preparing his commodities for the market is not materially increaſed, if performed, as it ought to be, by his own family.——It is certain that farmers in this neighbourhood have added to their conſequence very much within fifty years. I can ſend you the names of fifty of them, worth ten thouſand pounds each upon an average, amounting together to half a million ſterling, of their own or their father's getting within that period. This influx of wealth provides us with a ſhop, a butcher, a baker, a barber, a ſurgeon, an attorney, and ſome gigs, in almoſt every pariſh; but when I remember firſt, none of theſe exiſted between the two market-towns of Bridgwater and Axbridge. In Burnham, we had, when I was a boy, but two tea-kettles, and no watch. In the adjoining pariſhes of Berrow and Brean, there were neither the one or the other.

Improvement of Meadows, Watering, &c.

[By the Same.]

PART of a farm, ſeven acres and a half of meadow land, in 1748 was valued at 5l. per annum, having round its borders high banks, which had never been taken away from the time of its firſt being incloſed, and the middle of the field lay very low and wet. I adviſed the banks ſhould be removed to the depth of ſix inches below the ſurface, ſloping towards the ditches, and carried over the land, ſo as to make it entirely level; or, if any difference, higheſt in the middle of the field, which buried it in ſome parts to the depth of eighteen inches. It bore a good crop of horſe-beans where covered deep, and on the borders and ſuch parts as had very little earth thrown over it, blue marrow peaſe were planted with good ſucceſs, and plenty of white clover ſeed ſown all over the field. This finiſhed the buſineſs at the expence of 20l. excluſive of the ſurplus value of the corn exceeding the 5l. for rent. The ſecond year it bore a bad crop of graſs, which was, however, worth more than 5l. the old rent. The third year it was ſomething better; and by the fourth year it had a good ſound turf, ſo that the fifth year it was compleatly guttered; and by ſummer feeding, in a few years, it became rich paſture land, without the aſſiſtance of a ſingle load of dung or compoſt of any kind. It gradually increaſed in value till let to a tenant for 15l. per annum, and has continued at that rent to the preſent time.

One cloſe of eight acres belonging to this farm had been dug over in pits and pools, to repair the ſea-wall; and ſo exceedingly bad and irregular that it was thought incapable of improvement. It was therefore let to a tenant for five years, at 4l. per annum. At the end of this term, during which 20l. being expended with ſucceſs about the former cloſe, operated as a powerful motive to attempt doing ſomething to theſe eight acres; 40l. were accordingly laid out in draining and levelling, by which ſimple method of improvement it ſoon became worth 15l. per annum, and was laſt year ſold cheap by my ſiſter's huſband, for 360l.

Four acres of this land were let at 40s. per annum, but being ſo exceedingly poor, the tenant refuſed to continue the poſſeſſion, unleſs the rent was abated to 1l. per annum. This was inſufficient to keep fences and pay taxes, which amounted to more than 20s. a year upon an average for forty years together. Here, then, was a cloſe worth nothing, nay worſe than nothing, for when it was left open to the common it had ſtill taxes to pay. Theſe four acres of land were levelled upon the former plan, and ſoon after about 150 load, of 30 cwt. each, of dry ſand and dung, well mixed and turned, were ſpread over it; and this made ſuch an effectual improvement, that it was very ſoon let to a tenant for twenty-one years at 5l. per annum neat, clear of all diſburſements whatever. The term was expired three years ſince, and I have now let it at 6l. per annum, but it is worth more.

Six acres in one cloſe of another farm were ſo exceeding poor that I was glad to let it by itſelf at 40s. per annum. This, however, did not laſt long, for I added to my former method of hauling the banks into the low parts to make it plain and dry, ſeveral good dreſſings with rotten dung and good bank earth, mixed into a compoſt by two turnings, and this did the buſineſs; for I immediately let it to a tenant, for a term of fourteen years, at 10l. per annum.

I have made other improvements and experiments upon meadow land that have come very near to, but none that have exceeded, thoſe already related. I will here take the opportunity of introducing a few hundred acres lying in the pariſh of Mere, a great part of which I remember about forty years ſince was rented by a capital farmer and judicious grazier called Eſgar, at 1s. per acre; and ſome other parts were rented by ſundry other farmers, from 2s. to 5s. per acre. Mr. Eſgar purchaſed a large tract of this land in fee ſimple, and according to the report of the day, at *twenty ſhillings per acre.* He immediately began to exert himſelf in making this land lie plain and dry, his neighbours followed his example, and without the aſſiſtance of any aſhes, dung, ſoil, or compoſt of any kind whatever, part of theſe lands have been ſold at about 40l. per acre; and many hundreds per annum, the remainder, are at preſent worth 40s. per acre per annum.

In a journey to London, anno 1758, I obſerved upon a ſign in the road theſe words: "Peat aſhes ſold here." The meaning of this I could not comprehend, having always hitherto looked upon our peat aſhes to be of no value. I therefore made every neceſſary enquiry, and ſoon after my return home built a place to keep peat aſhes dry, and in May or June I had them ſown over ſome poor land, after the rate of four put-loads to an acre, and I ſuppoſe in a week it could be diſcovered to an inch how far they were ſown; nay, I have made one piece of three acres ſo rich by this method, that I will defy the moſt ſkilful agriculturiſt to make it richer.

When meadow land abounds with moſs, as is ſometimes the caſe, and the farmer hath no opportunity to tread it well with cattle by feeding them upon it in the winter or ſpring, I then recommend the ſpike-roller, as the beſt method of deſtroying it next to ſuch treading; but in this caſe there ought to be ſown ſome white clover or other graſs-ſeeds about the field; if in ſmall rain, the better.—*Feb.* 1789.

[*By Mr.* BOSWELL, *of Piddletown.*]

To the queſtion, "What water do the farmers in your "county prefer?" I can eaſily anſwer, 'That which has 'run ſome courſe, particularly when it has been aſſiſted by 'the run of farm-yards, arable-lands, ſheep-ſleights,' &c. This is the general opinion of the watermen and farmers here; they all agree that the leſs the water is ſtrained, and the nearer they take it from the river, the better it is, and the more it enriches the meadows, particularly when aſſiſted by the run of yards, &c.——When they are aſked to explain what they mean by being "*leſs ſtrained?*" they ſay, it is when the water is taken immediately out of the river, ſtream, &c. and conveyed upon the land, running directly off by the drains into the river again. If, inſtead of returning into the river, it be again conveyed upon the lands below, and thus repeated, it is then ſaid to have been ſtrained, and not ſo efficacious; but if it be taken out of the ſtream again, after it has run ſome way in the courſe, it is then called head-water, and uſed with ſucceſs. If an enquiry be made, "Where, "which are the beſt water-meadows?" The anſwer is, '*Thoſe above us*—enquire there; thoſe above us are better 'than ours, *for the water has not been ſo much ſtrained.*' This muſt, if repeated, ſoon carry us very near the ſpring-head.

I beg to be underſtood, that when I mention the *ſpring-head*, the particular ſpot where the ſpring riſes is not meant, but as far below it as there is any appearance of ſprings in or near the bed of the ſtream; which will oftentimes in ſmall rivulets be one, two, or more miles, below the ſpring-head. Nor is there a moment's doubt but that at a very conſiderable diſtance below, there are many very good water-meadows equal to thoſe higher up, but not in general; the variety of ſoil, (for ſome may be found better there than at the ſpring-head) and other local circumſtances, I preſume, occaſion it. Every one readily admits, that the ſame water, at the ſame time, will have different effects upon different ſoils; ſuch as a cold clay; a warm ſand, or gravel; and a boggy, deep, corky ſoil; therefore ſomething muſt be attributed to the ſoil.

To explain myſelf more fully, I beg leave to claſs the lands capable of being watered by ſmall ſtreams or rivulets, into three diviſions.—— The firſt are thoſe lands which lie at or near the ſpring-head. The ſoil of this diviſion is generally a light loam, tolerably firm though wet, and not more than from ſix inches to a foot deep; the under-ſtratum a ſpringy gravel. This claſs extends often much farther down the ſtream in ſome vales than others.——The ſecond diviſion I begin to diſtinguiſh where the ſoil gets deeper and heavier, often inclining to a clay or clayey loam, with ſome gravel in it. (This ſpecies is very cold, and the graſſes ſpring late.) Under this claſs may be reckoned a black, ſpongy, looſe, corky ſoil; the ſtream here (which before was ſmall) becomes larger conſiderably, and the lands on each ſide, which before were narrow, now ſpread to a conſiderable breadth. Under this diviſion the larger quantity of water-meadow in this country falls.—The third diviſion is compoſed of thoſe lands which lie flat, the ſoil very deep and looſe, often a moraſs, the bed of the river a bottomleſs ooze; a wear cannot well be erected acroſs it, nor the water drained off; little uſe is therefore ever made of it.

Upon lands of the firſt diviſion, the water, though moſtly perfectly clear, iſſuing immediately from the ſprings, and without any foreign aſſiſtance, has an amazing effect; the fertilizing quality is really aſtoniſhing. Meadows under this deſcription, if eaten quite bare, in the month of May, will in *five*, *ſix*, or *ſeven* weeks, have as much graſs in them as the mower can throw out with his ſcythe; from one to two and often three good waggon-loads an acre. Add to this, the herbage being better is of more value, and the meadows juſtly eſteemed the beſt.—Lands of the ſecond diviſion are certainly greatly benefited by the water being thrown over them, perhaps as much as the other, conſidering the difference of the two ſoils in their natural ſtate. This water having received all the advantages of the run of farm-yards, ſtreet dirt, arable lands, &c. the produce is very great. The quality, and indeed the quantity, is (I believe) always in proportion better or worſe, as the ſoil and ſituation approach the firſt or third diviſion.—Lands under the third deſcription I have had no experience in. I have hardly ever heard that any thing is made of them. Their produce is ruſhes, ſedge, and a coarſe three-ſquare graſs.

Extracts from divers Letters sent to the Society on the subject of Watering Meadows.

In the neighbourhood of Chard, and doubtleſs in many other places in the county where the benefit of good ſpring-water is known, it is preferred; and the farmers flood their meadows with it immediately from the ſprings, finding its effects ſo fertilizing as ſufficiently to maintain their meadows in good heart, without any other aid.

Near Taunton. R. P. A.

Water running from a ſpring, or out of a rock, is often preferred to water from a river that has paſſed ſome way. I apprehend, however, that this is not always the caſe; but ſometimes quite the reverſe. Springs coming immediately from a rock, or from the earth, are, I apprehend, of very different qualities.——It is underſtood by the farmers here, that water is very much impoveriſhed by watering a great many meadows on the ſame ſtream; and that thoſe meadows at the head of the ſtream are much the beſt on that account, except where there are a great number of farm-yards draining into it; which, in my opinion makes up in part at leaſt for the deficiency.

Maningford. J. A.

Water ſeldom, if ever, promotes vegetation, unleſs it be in a mixed or heterogeneous ſtate. It is therefore neceſſary, previous to the flooding of meadows, to examine of what nature and quality your water is. All water that paſſes through beds or veins of minerals, or which contains calcareous nitre, copperas, allum, &c. is highly prejudicial to graſs lands. But water that iſſues from chalk cliffs, or limeſtone rocks, or ſand and gravel, is in general friendly. The beſt teſt is its ſoftneſs, which may eaſily be known.——The quantity of water that is let over the land ſhould be in proportion to the nature of the ſoil, and the heat of the ſeaſon. If the ſoil be ſandy, gravelly, or chalky, and the declivity conſiderable, the more water is wanted, and it ſhould remain the longer, eſpecially if the weather be warm, and it be a ſouth aſpect.——If your water has run a long courſe above ground, the fouleſt is the beſt; but that coming immediately from chalk or lime rocks is warmeſt, and much to be preferred to foul muddy water in general. I muſt however obſerve, that water in a ſtate of putrefaction is poiſon to vegetables, and therefore ought never to be uſed for this purpoſe. S. B.

Water when carried over meadow-lands after heavy rains, depoſits a fertilizing ſediment, which enriches the ſoil, and turns the mould blackiſh. It alſo promotes the ſpeedy putrefaction of every vegetable and animal ſubſtance found in the earth, and thereby contributes to the melioration of the ſoil under the turf. The beſt water is that from clear warm ſprings, and the ſofter the better; but if that cannot be had, brooks which are become foul by running in a muddy channel, will be the next beſt: for a ſtream which continues clea after it has run a conſiderable way above ground, is generally cold, and impregnated with metallic or mineral particles, both which are deſtructive to vegetation. J. F.

On the receipt of your letter, I conſulted my meadow floaters, who are unanimouſly of the opinion, that the ſooner the water is thrown over the meadows after it riſes out of the ſprings, the more efficacious it will be.

Ramſbury. W. J.

I have a range of meads lying nearly on a level by the ſide of a little river, which runs near thirty miles before it reaches my lands. And in the upper part of my meadows a ſpring riſes of very clear ſoft water. When I have turned the water of my ſpring over the land, I have found the produce equally great, and the hay much finer and ſweeter than when I have turned the river water over it. I have alſo obſerved, that thoſe meads which firſt received the water from the ſpring, were moſt luxuriant; and thoſe which it ran over laſt the leaſt ſo. I am therefore of opinion, that the beſt and moſt fertilizing water for meadow land, is that which iſſues immediately from warm ſoft ſprings. W. M.

The occupiers of lands on the river Kennet are uniformly of opinion, that the more thick, turbid, and feculent, the water is, the greater will be the benefit to be derived from the uſe of it; and the opinion is certainly well ſupported both by reaſon and experience. The benefit derived from flooding, may in general then be computed, *cæteris paribus*, from the quantity of feculent matter depoſited by the water; for it is, I believe, invariably found to be in proportion thereto.

The effects of the water of land-ſprings muſt depend upon the nature of the ſtrata through which it paſſes; and may be beneficial or otherwiſe to vegetation, as that might be if applied in ſubſtance. Calcareous earths, in general, are friendly and conducive to vegetation; and from thence it ſeems probable, that water iſſuing from limeſtone rocks would promote the growth of vegetables in proportion to its impregnation by the calcarious matter.

It is in every one's experience, that the excrements and corrupted ſubſtances of animals, when properly digeſted, are the moſt powerful promoters of vegetation; and plants ſo produced become the wholeſome and neceſſary ſupport and food of man: ſo that what was laſt year a poiſonous putrid maſs, is this, by the wonderful chemiſtry of nature, and a rapid circulation through a ſyſtem of organized bodies, converted into a ſubſtance endued with life, ſenſation, &c.—— The earth may be conceived to be the matrix of vegetation; and the huſbandman certainly knows from experience, that by impregnating it with certain ſubſtances, by laying them upon it at proper ſeaſons, a ſoil naturally ſterile may be rendered fertile. So a meadow floated with water, copiouſly abounding with putreſcent particles, and ſubſtances impregnated therewith, would infallibly be benefited thereby; the *modus operandi* of which may literally (though in a groſs ſenſe) be certainly imputed to the action of the fertilizing matter depoſited by the water in the form of an unctuous ſediment, in the ſame manner as all lands are benefited or improved by the acceſſion of manure, by whatever means it is depoſited there. JOS. WIMPEY.

On Draining Land.

Colonel Wood complains, in a letter dated from Piercefield, near Chepſtow, that little is ſaid about draining in the Agricultural Papers. Perhaps it is a ſubject very difficult to diſcuſs in an eſſay, or to lay down on paper rules for, or thoroughly to deſcribe. However we find an *Account of the Reclamation of a Snipe Bog*, in forming the Andover canal, by Mr. South, dated Boſſington, Aug. 9th, 1794. This land lay ſo low between two rivers, that it was deemed almoſt impracticable to make it healthy. Tempted, however, by the quantity of ſoil at hand, the experiment was tried, and the plan (which was as follows) ſucceeded beyond expectation.

The hillocks, conſiſting of a light ſpongy ſubſtance, were in the firſt place cut down, thrown together in lines eight or ten feet broad; the water was drained off in the next, and by an open channel conveyed into the river near 200 yards below. The whole ground was then laid out in beds or oblong compartments, about twenty feet wide, having headlands with furrows to the eaſt and ſouth-weſt, to receive the ſoakage of the rivers, and a main drain at the bottom, to convey the water to the diſtance above-mentioned. This done, a mixture of the loam, malm, and gravel, was laid about 16 inches thick over the inverted hillocks, along the centre of the beds, ſloping off each way to their edges. Ditches two feet wide, and a ſpit and a half deep, were then ſunk between bed and bed, communicating with the drain below. The peaty ſubſtance thrown out of theſe ditches was ſpread over the centre of the beds, ſo as to form a compoſt with the loam, gravel, &c. and the ditches themſelves were afterwards filled with ſheer gravel ſo high as to remain like furrows to the beds, which, by the addition they had received, were now become ridges of conſiderable elevation. Having proceeded in this manner through the piece, and given three ploughings to mix and meliorate the ſoil, it was ſowed, in 1793, with white oats, cow-graſs, and Dutch clover; of the former, only three buſhels per acre were allowed, the graſs being my chief object. The corn, though ſowed ſo thin, produced five quarters to the acre, and the graſs is ſo ſtrong and well ſet, that there is no ſuch plant to be ſeen in the neighbourhood.

On Cattle and Sheep, Breed, Wool, &c.

[*By Mr.* SMITH, *Lye, near Alresford.*]

A Croſs breed from Leiceſterſhire rams and the common Hampſhire ewes, have been found remarkably profitable. Our beaſts, bred from Mr. Bakewell's ſtock, are remarkably ſhort-legged, very broad over their backs, and very quick feeders. I aſſure you that three of them will fatten in the ſame time that two of your's will. I therefore conceive the croſs breed will be very uſeful in thoſe points that the cattle of Somerſet and Devon fail in. My farm is on a very poor chalky ſoil.

[*By Sir* THOMAS BEEVOR.]

The cows you ſaw were bred from the polled or hornleſs Suffolk dun-coloured cows, (than which, for *profit*, though not for *beauty*, I think, with the moſt intelligent Mr. Young, there is not ſo valuable a breed in England) by a Derbyſhire black and white bull, given me by my friend Lord Townſhend. This mixture produced their uncommon colour of mouſe and white, as well as that ſhape and make which pleaſed you, and is ſo much eſteemed by the beſt judges of cattle; their heads and necks being ſmall, their legs ſhort, carcaſes large and deep, and loins remarkably broad; and being of greater weight in ſeemingly leſs compaſs than any beaſts I ever ſaw; whether, from being without horns, from being conſtantly kept in ſhedded yards or houſes during the winter, from their nature, or from theſe cauſes altogether, they are ſo tame and docile, that I never knew any miſchief done by them to any other animal. In the ſummer, for the ſake of ſhade, and in the winter for ſhelter, they herd together in the manner of ſheep, without offering the leaſt injury to each other. They feed in the park in ſummer; and in winter, ſuch of them as are not in full milk are fed in the yards on barley or oat ſtraw, and on the leaves and offal of the turnips, which are given to thoſe which have more lately calved, and are kept in the houſe; thoſe houſed have therefore, you ſee, the roots, and the beſt of the turnips or cabbages with ſtraw; for hay is never given here to cows. Their average profit per annum, when a regular account of them was kept a few years ſince, was, after all charges deducted for keeping, and every fair article of expence, four pounds per cow; but as this profit will probably be found ſhort of the profit of many other breeds, it ſhould be mentioned, that the weight of theſe beaſts on an average, as they are in milking, does not exceed thirty-ſix ſtone; ſome indeed, are bigger, but others are not ſo large. For hardineſs, docility, and ſhape, I think there are few to compare to them. But to obtain, and preſerve the laſt, in theſe, and every ſpecies of animal, there ſhould be an uniform and conſtant attention paid to the rearing always the beſt and prime of the ſtock, and getting rid of every other. That, and that alone, will, I believe, go near to enſure a good, valuable, and handſome ſtock of every kind.

[*By Mr.* TURNER, *Philadelphia.*]

The American buffalo is, if I miſtake not, the biſon of Buffon. Immenſe herds of this animal roam at large, in Interior America; from Green-River to the Miſſiſſippi, the ſhores of the Ohio are lined with them. The hunters are too apt to deſtroy them wantonly; a circumſtance much to be regretted, and not to be prevented. The boſs on the ſhoulders of the buffalo is, as well as the tongue, extremely rich and delicious, ſuperior to the beſt Engliſh beef.

There is a ſingular, an affecting trait in the character of the buffalo, when a calf. Whenever a cow buffalo falls falls before the lead of the hunters, and happens to have a calf, the helpleſs young one, far from attempting an eſcape, ſtays by its fallen dam, and follows the hunter with the carcaſe.——The ſtep of the buffalo is quicker than that of the ox; but there is another property in which he far ſurpaſſes the ox—his ſtrength. Judging from the extraordinary ſize of his bones, and the depth and formation of his cheſt, I ſhould not think it unreaſonable to aſſign nearly a double portion of ſtrength to this very powerful inhabitant of the foreſt.

[*By Dr.* ANDERSON.]

It has been hitherto in general believed, that the ſheep is univerſally a wool-bearing animal, and that there is no other creature upon the globe that carries *wool*, in the ſtrict and proper ſenſe of the word, but ſheep alone. But there is now reaſon to doubt if either of theſe propoſitions be ſtrictly true.

CLASS FIRST.

WOOL-BEARING SHEEP, *properly ſo called*.

This claſs comprehends a great many of the varieties of ſheep found in Britain, and throughout the greateſt part of Europe. Sheep referable to this claſs are alſo found in Aſiatic Ruſſia, in Africa, at the Cape of Good-Hope, and in various parts of India. Among moſt of the varieties of this claſs, unleſs where it has been purified by a careful ſelection continued for many years, there is found intermixed with the wool, in different proportions, a kind of ſhort, opaque, brittle, unelaſtick hair, uſually of a dead white or chalky colour, which is well known to manufacturers, and is eaſily diſtinguiſhable from other hair. It is known by the name of *ſtitchel* hair in ſome places. In other places, it is called *kimps*; and probably it has many other local names with which I am unacquainted.

CLASS SECOND,

HAIR-BEARING SHEEP,

Whoſe pile is long in the ſtaple, and of a quality that admits of being employed in many manufactures, nearly for the ſame purpoſes as wool.

Sheep referable to this claſs have been uſually confounded with the former, inſomuch that they have almoſt entirely eſcaped the notice of naturaliſts and others. The pure breeds of this ſort are ſcarcely any where to be found among *manufacturing* nations; but they are reared, in preference to the wool-bearing ſort, among the Ruſſians and other northern nations, where the ſkins of ſheep, with the fleece on, are uſed for clothing, as they are found to be much more durable.

Wool, like the body hair of moſt animals, is an annual production, ſpringing from the ſkin of an animal. A filament of wool has no determinate proportional thickneſs in its different parts, but is variable in all poſſible proportions.

But as all the different varieties of ſheep breed readily with each other, and produce a mongrel race, in which the diſcriminative qualities of the parents are blended together, it neceſſarily follows, that where the mongrel breed is produced between a wool and a hair-bearing race, it will afford a fleece that can neither be diſtinctly characteriſed as hair nor as wool, but will participate of the qualities of both.

The moſt uncontaminated breed of wool-bearing ſheep I have as yet met with, is the Shetland breed, and there the wool riſes ſo entirely from the ſkin, about the middle of June, as to render the ſhearing of their ſheep unneceſſary. It may be plucked off at that time without occaſioning to the animal the ſmalleſt uneaſineſs, as it will fall off of itſelf if not taken away; the young fleece ſpringing up beneath it like a young ſhorn fleece. The ſame phenomenon is obſervable in all the breeds of ſheep in the northern parts of Scotland, where the proper time for ſhearing is always indicated by nature, and muſt be attended to.

The pureſt of the hair-bearing ſheep I have ſeen, were ſome fleeces that were ſent to me from the Baltic, which were as evidently hair as the fleece of a goat, though finer and ſofter. The Ruſſians prefer this breed of ſheep, becauſe the fleece, when at its full length, adheres ſo much more firmly to the ſkin than wool does, that it laſts much longer when made into clothing than the other; for which reaſon, a wool-bearing ſheep among them is a great rarity. Among the ſheep referable to this claſs, there are ſome breeds which afford a ſmall quantity of a very fine and ſoft wool underneath the hair, of which the *Argali* of PALLAS is a noted example.

The very long wool of Lincolnſhire, which I have examined with care, appears to be from a mongrel race, very nearly allied to this claſs, with a ſmall blend of wool in it; and is of a harder feel than ſome of the pure hairy breeds, ſome of which are tolerably fine and ſoft, and very tough and durable in work, and have a fine gloſſy ſilky-like appearance. I have had wool, of the genuine wool-bearing breed of ſheep, that meaſured 17½ inches in length, which was extremely fine and ſoft, and nothing reſembling that huſky kind of hair-wool in Lincolnſhire.

CLASS THIRD.

SHEEP *that carry* SHORT THICK HAIR, *which in no reſpect reſembles wool of any ſort.*

Of this variety of the ſheep ſpecies we have no breeds in Britain; but that ſuch ſheep do exiſt, we have the cleareſt proofs. So little are they known indeed in this country, d ſo little is it ſuſpected here that ſuch an animal exiſts, at I was not a little ſurpriſed when I firſt ſaw one of this nd, and therefore examined it with a good deal of attenon. This was a ram brought from the iſland of Madaſcar; of a good ſize, and covered all over with a thick at of ſhort thick ſtiff hairs, like that of a horſe, but rather ronger in the pile and ſhorter. The colour was a fine rown, the hair lay cloſe to the ſkin, and was very ſmooth d gloſſy, like the coat of a well-dreſſed horſe in fine order. hey aſſured me that it had never had any other covering n it but what I ſaw, and that all its companions were of e ſame ſort. I have had an opportunity of ſeeing a nightown, lined with Buckharian lamb-ſkin fur, which conſiſts *hair*, without the ſmalleſt intermixture of wool.

Sir Joſeph Banks, bart. on this ſubject ſays, “I once imported three ſheep from Spain, which were as ſleek and ſmooth as a horſe, and never, at any ſeaſon, ſhewed the leaſt ſign of wool or down in the moſt minute quantity.” he fact then is inconteſtibly eſtabliſhed, that ſheep which roduce as little wool as horſes, do exiſt; and perhaps they e much more common than we at preſent ſuſpect. The uckharian breed of ſheep is kept in immenſe flocks over the xtenſive plains of Great Tartary. Since the above was ritten, I have been aſſured that they have a breed of this ind of ſheep in the iſland of Antigua.

There is no man in Britain who has not had occaſion to bſerve as great a diverſity in regard to the coat of dogs as f ſheep. The ſmooth-haired dog; as the Italian greyound, and Spaniſh pointer. The long-haired, ſoft, wavyeeced dog; as in the Engliſh ſpaniel, and Newfoundland og. The wool-bearing dog, or the dog that carries a coat hich, for cloſeneſs, length, and ſoftneſs, may be compared o wool, is very common.

The ſame diverſity is obſervable in regard to goats: as, The ſmooth ſhort-haired goat, very common. The long-haired ſhaggy goat, very common alſo. The wool-bearing goat, (for ſo I think the Angora goat may be called) whoſe hair is as fine, as ſoft; and as fit for work, as almoſt any wool; but whether it *riſes* like wool, or is in this reſpect like hair, I have had no opportunity of obſerving.

Of all the varieties of domeſtick animals we have been accuſtomed to rear in Europe, next to the ſheep, the bullock is the moſt valuable. We, like the inhabitants of Madagaſcar with regard to ſheep, have been hitherto in the cuſtom of rearing the ſmooth-haired bullock only; and though we may have accidentally heard that there are ſome varieties of this claſs of animals that carry ſomething like wool, in other parts of the world; yet, as theſe have never preſented themſelves to us, we either doubt if ſuch animals do exiſt, or conclude they would not thrive with us, and therefore ſit ſtill contented with what we have, without making any efforts to better ourſelves. Is it not a well-known fact, that we have continued for more than a hundred years paſt to import wool from Spain in great quantities every year, without ever once attempting to rear the breed of ſheep that produced it, though they were in a manner at our door? And is it not alſo known, that inſtead of making a fair experiment to aſcertain with certainty whether that wool could be produced here or not, writers have been ſquabbling with each other about the poſſibility of a thing which could never be proved *pro* or *con* by reaſoning, but by fair experiment only. And is it not alſo a fact, that although it be now proved to demonſtration, by repeated experiment, that the wool of ſheep brought from Spain does not degenerate in Britain, there has been till this hour no attempts made to obtain a ſingle individual of the *fineſt* breed of ſheep from Spain.*

That there are nearly an equal diverſity of breeds of cattle as well as of ſheep, ſcarcely admits of a doubt, of which the following facts are proofs:

1ſt. The ſhort ſmooth-haired breeds. Of theſe, the ſhorteſt I have ſeen, is a bull of the *Zebu* kind; his hair did not exceed half an inch in length, and was very cloſe, firm, and elaſtick.

2dly. The long, ſoft, wavy-haired breeds. Of theſe, the Lancaſhire cattle are a good example; and many of the Highland breeds, ſome of which have manes like horſes.

3dly. The long, ſoft, wool-like bearing breed; of which the buffalo (or rather biſon) of Louiſiana is the chief.

4thly. The long-haired wool-bearing breeds. Belonging to this claſs there are three varieties obſcurely known, viz.

1ſt. The *Sarlue*, by ſome naturaliſts called the grunting-ox, an animal of Southern Tartary, which is not yet ſufficiently known. The fleece of this creature is ſaid to be thick and long, falling down below its knees, and of a very fine quality.

2dly. The Chittigong cow, of the higher Hindoſtan, which is deſcribed nearly in the ſame terms. Its hair, or wool, is much eſteemed by the natives, and is applied by them to various purpoſes.

3dly. The Muſk-ox of Hudſon's-bay. The whole body of this creature, which is as large as a middle-ſized ox with us, is covered over with a very cloſe fleece of long, ſoft, flexible hair, of a fine quality, which might be employed in manufactures for many of the ſame purpoſes as wool; beneath that hair, and towards its roots, lies another coat of exceeding fine wool, which could be applied in fabricks of the fineſt quality. It has been ſpun and worked into gloves and ſtockings, which are ſaid to be ſoft as ſilk.

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* If it be objected to this, that the Marchioneſs Del Campo has ſent ſome of the breed to the King of England, in whoſe poſſeſſion they now are; the Dr. anſwers, that they are not of the beſt ſort, or thoſe which bear the fineſt wool.

It is now aſcertained, that all the varieties of ſheep yet known do readily intercopulate with each other, and that the progeny is a prolific animal capable of continuing the ſpecies; but that in reſpect to its characteriſtic qualities, it is a *mongrel* race, participating nearly alike of the qualities of both its parents.

The effects of climate and food, in altering the qualities of the *breed*, are found to be nothing; though the effect of theſe things upon the individual creature that is ſubjected to their influence, may in ſome caſes be very perceptible.

Richneſs of paſture tends to produce temporary changes. Reſpecting the wool: there is reaſon to believe it tends to augment its length *in ſome degree*, though but a little; it adds to its ſoftneſs and toughneſs; but in regard to coarſeneſs or fineneſs, no fact has as yet been found to aſcertain that it has any ſenſible effect, though I am aware that *opinions* are here as deciſively adopted as if the facts had been fully aſcertained.

The influence of breed, in propagating the qualities of the parent ſtock, or in altering the qualities of it at pleaſure, by blending it with others, may be ſaid to be all-powerful. There is not a ſingle fact, that I have ever been able to meet with, properly aſcertained, that tends to ſhew that the diſtinguiſhing peculiarities of any breed of animals can be ſenſibly changed in its eſſential characteriſticks, by any change of climate, or any other circumſtance, except an intermixture of bread alone; but innumerable facts may be found that aſcertain the contrary. The Perſian and Arabian breeds of horſes brought into Europe, are only changed by intercopulating with other breeds. The Chineſe hogs may be continued for ages unchanged, if no croſs be permitted. Theſe facts are notorious, and every other fact upon this ſubject tends to eſtabliſh the ſame concluſion.

Although the ſame breed of animals appears not to be liable to be changed by climate or other extraneous cauſes, yet it is found by experience, that individuals may be found among every breed of animals, which, from circumſtances that have hitherto eluded our obſervation, and which it therefore exceeds our power either to accelerate or retard, may be met with, which are, in ſome leſſer circumſtances, different from others, though they ſtill poſſeſs the general characteriſticks of the parent breed.

[*By Mr.* Billingsley.]

Two farmers of eminent rank in the breeding line, one of whom was a warm partizan in behalf of the new Leiceſter, and the other of the Cotſwold ſheep, agreed to ſubmit to the following experiment under my guidance and direction: namely, that five two-tooth wedders (ſheep about 1¾ year old) of their reſpective flocks, ſhould be ſent to my farm the enſuing January; that they ſhould be kept together one whole year, be regularly folded every night, and in all reſpects treated alike. That they ſhould be killed at the Society's annual meeting in December, and that a public teſtimony ſhould be given of the merit or demerit of each.

A trial ſo fair could not fail attracting the notice of all perſons intereſted in the event, and a propoſal was made and ſeconded, that other ſorts of ſheep to which any of the company might be partial, ſhould be added, for the purpoſe of aſcertaining their reſpective merits, Accordingly, ſix ſorts were ſent to me in the beginning of January 1792, viz.

5	Leiceſter from Mr. More, of Charlcote, Warwickſhire.
5	Cotſwold from Mr. Pacey, of Northleach, Glouceſterſhire.
5	South-Down from Mr. Gale, of Stert, Wilts.
15	of the polled breed.
5	Dorſet from Mr. Hix, Caſtle-Cary, Somerſet.
5	Wilts from Mr. Tinker, Chittern, Wilts.
5	Mendip from Mr. Parſons, Blagdon, Somerſet.
15	of the horned breed.

With a view of proceeding regularly and impartially in the experiment, I had the whole lot weighed after twelve hours confinement without food. This was done on the 3d of January 1792, and the weighing was continued regularly every month till the time of their death. The reſult will appear in the following tables.

Mendip.	5

Dorſet - - 5 S

Gloceſter - 5

Mendip - 4 ditto

THIRTY SHEEP WHEN WEIGHED.

1792.	Jan. 3.	Feb. 7.	March 13.	April 3.	May 8.	June 4.	July 6.	Aug. 10.	Sept. 5.	Oct. 12.	Nov. 5.	Dec. 1.	Dec. 8.	
Leiceſterſhire. Mr. MOORE.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	Increaſe in 12 months 97½ lbs. Wool, 39lb. 12oz.
No. 1. -	117	107	110	110	114	116	114½	99	109½	114	120½	124½	126½	
2. -	129	118	117	117	125	130	126½	132	137	139	146	152	152	
3. -	139½	129	126	123½	128	134	134	137	141½	145½	154	161	162	
4. -	145	136	135	131	137½	143½	140½	142	146	146½	151½	156	155½	
5. -	134	121	120	120	134	138	139½	139½	145	147	156	164½	166	
	664½	611	608	601½	638½	661½	655	649½	679	692	728	758	762	
Glocesterſhire. Mr. PEACY.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	Increaſe 255lb. Wool, 36lb. 2 oz.
No. 1. -	124	123	131	134	149	151½	152	154½	159	161	169	174	175	
2. -	152	150	161	158½	174	182½	182	187¾	196½	182	198	209	214½	
3. -	139½	134	149	141½	155½	163	161½	162	159	158	170	178	183½	
4. -	133½	126½	143	126½	137	145	150	156½	160	175½	172	177½	181½	
5. -	148½	144	149	139	150½	163	165	169	166½	164½	187	193	198	
	697½	677½	733	699½	766	805	810½	829	841	841	896	931¼	952½	

THIRTY SHEEP WHEN WEIGHED.

1792. *Sussex.* Mr. MICHILL.	Jan. 3.	Feb. 7.	March 13.	April 3.	May 8.	June 4.	July 6.	Aug. 10.	Sept. 5.	Oct. 12.	Nov. 8.	Dec. 1.	Dec. 8.
	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.
No. 1. -	99½	93	90	87	dead.								
2. -	89	87	93	90½	101	110	112	115½	119	120½	126½	126½	126½
3. -	97½	92	95	97	105	115½	122	123	126	126	135	132½	132½
4. -	97	90	92	97½	107½	112	120½	110	119½	116	131	134	136
5. -	95½	94½	99	99½	105	109	111	109	108½	129	123	126½	127½
	478½	456½	469	471½	418½	446½	465½	457½	473	491½	515½	519½	522½
Wiltshire. Mr. GALE.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.
No. 1. -	110½	113½	118	121	138½	144	150	146	153½	163½	176	184	183½
2. -	110	112	125	125½	133	141	151	154	159½	146	160	164½	165
3. -	108½	108½	108	leg	broke.	123	131½	131	141½	148½	159½	170	170
4. -	119	123	130	123	135	138½	151	147	146½	153	165	168½	166½
5. -	111½	109½	123	124	137	143	151	140½	155½	161	172	178	175
	559½	566½	604	493½	543½	689½	734½	719	756½	772	832½	865	860

Increaſe 143½ lbs.
Wool of 4 Sheep, 14lb. 8 oz.

Increaſe 300½ lbs.
Wool, 9lbs. 8 oz.

THIRTY SHEEP WHEN WEIGHED.

1792.	Jan. 3.	Feb. 7.	March 1	April 3.	May 8.	June 4	July 6.	Aug 10.	Sept. 5.	Oct. 12.	Nov. 8.	Dec. 1.	Dec. 8.	
orsetshire, Bred in Somerſet. Mr. Hicks.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	
No. 1. -	134	134	147	144	154¼	162	166	166	173	171	182	185	188	Increaſe 275½lbs. Wool 22lbs 12 oz.
2. -	122	123	133	131	142	148	153½	149	157½	164	176	180½	180	
3. -	125	124½	137	134	146	153	160	159½	164	166	165	174½	177½	
4. -	139	141	149	147½	163	165	173½	176	179	181	190	196	199	
5. -	126	124½	133	132	145	151	159½	156½	165	166	172	176	177	
	646	647	699	688½	751½	779	813	807	838½	848	885	912	921½	
Mendip. Mr. Parsons.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	
No. 1. -	76	78½	86	86	93	98½	103½	106	109½	109	114	118	118½	creaſe 275½lbs. ol, 22lbs. 12 oz.
2. -	75	74½	81	81	92½	94	98	95	97	104½	108½	110½	111½	
3. -	88	88	97	94	103	109	118	113	121	126	132	135	137	
4 -	84½	88½	96	97	107	112	120	114	118	124	134½	140½	140	

[ANONYMOUS.]

That the ſoil and climate of this iſland are naturally adapted to the production of fine wool, will ſcarcely be diſputed; the well-known fact that it did once produce the fineſt wool in Europe being a ſufficient proof of this circumſtance; but that ſoil and climate alone are not ſufficient to over-rule the influence of all other circumſtances, our own experience alſo too clearly proves. To be able to judge how far *nature* aſſiſts us in this enterprize, and in what reſpects it becomes neceſſary to call in the aſſiſtance of *art*, the two following facts ought to be very particularly adverted to.

1ſt. *Every filament of wool is greatly altered by the heat or the cold that the animal producing that wool is ſubjected to during the period of its growth; that part of the wool being always coarſeſt which is produced in warm weather, and the fineſt in cold weather.* It is well known, that on account of the inſular ſituation of Britain, though our winters be not intenſely cold, we never experience ſuch a degree of heat in ſummer as takes place in France and other continental countries. In this reſpect, and in this reſpect alone, is Britain favoured by nature beyond other countries, in what regards the rearing of fine wool, *ſuppoſing they were equally in poſſeſſion of the ſame breed of ſheep.* And when we advert, that, in ſome of the *northern* parts of this iſland eſpecially, the winters are ſo moderate as ſeldom to deprive the flocks from reaching their food on account of ſnow; and the heat in ſummer ſo moderate as to be no more than ſufficient to produce graſs in abundance, without danger of parching it up; we ſhall be forced to acknowledge that this is a great bleſſing with reſpect to the rearing this kind of ſtock.

It is a fact well known, and confirmed by daily experience, that *every diſtinct breed of ſheep, whatever qualities it may* *poſſeſs, continues to propagate its own kind without any* PERMANENT *variation, as long as it is kept from intercopulating with other breeds of ſheep: But if different breeds be ſuffered to intercopulate, a mongrel breed is produced, which participates of the nature of both the parents, without poſſeſſing in full perfection the qualities of either. This mongrel breed may be in like manner farther altered, by being mixed with other breeds; and ſo on* ad infinitum.——The different breeds of ſheep are diverſified almoſt without end; and they are ſo much intermixed in every country in Europe, that if the beſt breeds are not carefully attended to by their owners, and kept in flocks of one common kind covering a large extent of country, they will be conſtantly intermixing with others, and thus be greatly debaſed. The influence of climate can extend no farther in correcting this diſorder than has been already ſpecified. In the ſame climate may be found two breeds of ſheep, one of which carries wool like coarſe hair, and the other fine wool, ſoft as ſilk. This laſt breed, if perfectly ſecluded from the other, may be preſerved without degenerating for ages; but unleſs this ſecluſion, at the proper ſeaſon, be perfect, it will be every year more and more debaſed. Although it is an enterprize of very great difficulty for the inhabitants of moſt countries where ſheep carrying wool of a coarſe quality much abound, ſo to preſerve a ſtrange breed of fine-woolled ſheep, as that their deſcendants ſhall continue to carry as fine wool as that of the parent ſtock; yet might we, in many of the ſmall iſlands on the coaſt of Great-Britain, propagate any particular breed of quadrupeds we may incline, by enabling us to keep it, as long as we ſhall think neceſſary, perfectly iſolated from every other breed, without ſubjecting us to the ſmalleſt expence to effectuate that ſecluſion. Here the parent ſtock could be preſerved for ages, and improved; from whence the colonies could be ſupplied with unadulterated rams, and freſh drafts of ewes, to keep up the breed; which, without this precaution, would, in more expoſed ſituations, greatly degenerate. We have it thus in our power, without trouble or expence, to make whatever experiments we may incline in improving the breeds of domeſtick animals, either upon a large or ſmall ſcale, as circumſtances ſhall require.

To effectuate theſe deſirable purpoſes, I beg leave to propoſe, that a Society ſhould be inſtituted under the name of *The Society for improving the quality of Britiſh Wool.* There exiſts in this iſland at preſent the remains of at leaſt *three* diſtinct breeds of ſheep, that are peculiarly valuable on account of the quality of the wool produced when uncontaminated by foreign mixtures; but which, in the preſent ſtate of this country, run a great riſk of being entirely loſt in a few years, if no effectual method ſhall be now taken to recover and preſerve them. The firſt care of ſuch a Society ſhould naturally be directed towards the recovery and preſervation of theſe valuable breeds of our native ſheep.——The firſt of theſe kinds I ſhall mention, as being perhaps the moſt nearly loſt, and as carrying the fineſt wool that has been known in this iſland, may be diſtinguiſhed by the name of the *Highland* breed. This breed of ſheep was formerly to be met with in the higher parts of Aberdeenſhire, and in all the counties of Scotland to the northward of that; but now the breed is there ſo much adulterated by intermixture with other ſorts, as to give no room to hope that any of the genuine breed could be found in thoſe parts. In the Weſtern iſlands, though for many years paſt little attention has been paid to ſheep, the original breed has not been quite ſo much debaſed as on the main land; and ſome of them might there be picked up with care tolerably good. The ſame ſort of ſheep, I have alſo been told, are found in the Orkney iſlands; but it is believed, the pureſt of this breed that at preſent exiſts is in the Zetland iſles. This is a ſmall, hardy, though delicate looking animal. Its wool is remarkably fine in ſtaple; but its moſt diſtinguiſhing peculiarities are, a ſilky gloſs to the eye, and a peculiar ſoftneſs to the touch, that no other wool I ever ſaw poſſeſſes. It is not frizzled up like Spaniſh wool, but in its native ſtate is gently waved, and is rather longer in the ſtaple. When compared with the beſt Spaniſh wool that could be bought in the London market, it was found, upon a fair comparative trial, to be finer than the Spaniſh, in the proportion of nearly ſeven to four. Stockings have been made of it in Aberdeen that were ſold for five and ſix guineas a pair; and at this preſent time many pairs of ſtockings are made of it each year in Zetland, which, though not delicately manufactured, nor properly dreſſed, but merely on account of the fineneſs and peculiar *ſoftneſs* of the materials, ſell in the ſhops at fifteen and ſixteen ſhillings a pair. The ſheep of this breed are for the moſt part entirely white, but ſome of the ſame ſort are of a dun or fawn colour, ſome black, but a greater proportion of a beautiful ſilver grey, with a fine gloſſy luſtre. The two other valuable breeds of ſheep, natives of this iſland, are thoſe that carry the long wool fit for combing, of the fineſt quality, and that kind which carries the beſt ſhort clothing wool; both theſe breeds are natives of England and Wales.

Spaniſh wool is now in ſuch high eſtimation for manufactures, that it would doubtleſs be one of the firſt enterprizes of this Society to obtain a parcel of this breed of ſheep; and though the penalty for tranſporting ſheep out of Spain be nothing leſs than death by law, yet it will be no difficult matter to get any number of ſheep from thence that may be wanted. The Spaniſh ſheep not only afford a fine wool, but, as they are a large, ſtately, full-bodied animal, would, if well choſen, be valuable as well on account of their carcaſe as their fleece. Another breed of ſtately, well-bodied ſheep, that carry fine wool, are to be met with in Barbary; and would, no doubt, claim the early notice of the Society.

It is not to be expected that the *Tarentine* ſheep will now, after ſo many ages of neglect, carry as fine wool as in the time of the ancient Romans, when it was ſo highly celebrated; but we are aſſured by modern travellers, that theſe ſheep are ſtill diſtinguiſhed above all others in thoſe regions for the fineneſs of their fleece. The only other breed of European ſheep I have heard of, that promiſes to anſwer our preſent purpoſe, is one that has lately been diſcovered in the Crimea, which carries a fleece of a grey colour, and very fine quality. The fineſt wools, however, that are brought to European markets, are the production of Aſia. *Perſia*, *Caſhemire*, and *Thibet*, are the countries from whence they come; and it would be an object of great importance, and highly worthy of ſuch a Society, to obtain ſome of the beſt breed of the ſheep of each of theſe countries.

The *Paco* and *Vicuna* of South-America, commonly called *Peruvian ſheep*, though they be, ſtrictly ſpeaking, of the camel tribe; yet, as they carry wool of the nature of that of ſheep, only finer in quality, ſhould alſo be attended to by the Society. The only other animal that occurs to me, as carrying a fleece uſeful in our manufactures, is the Angora goat. This kind of goat has been reared in France and in Sweden; in both which places it thrives as well as in its native country, and carries the ſame kind of long ſilky fleece.

Spaniſh wool has been long an article of import into this country, and in the year 1787, no leſs than four millions one hundred and eighty-eight thouſand two hundred and eighty pounds of Spaniſh wool were imported into Britain, the value of which was upwards of *ſix hundred thouſand pounds*.

[*By the Rev. Mr.* ONLEY.]

I have been informed, by a very eminent manufacturer, that many years ſince an attempt, from a ſuppoſed ſimilarity of paſture, was made to introduce the long-wooled Lincolnſhire breed into the hundreds of Eſſex. The ſtaple was perfect at the firſt year, declined in the ſecond, and was loſt at the fifth. Repeated new ſupplies and croſſings might have kept up ſomewhat of the ſpecies, and ſettled at laſt a near approach to it. This is now trying here between the Norfolk and the South-Downs; and promiſes a breed that may unite very tolerable wool with a very fine carcaſe, equally proper for the fold and artificial paſture; of a bulk ſuperior to the South-Downs, inferior to the Norfolk, but ſmaller in the bone, rounder in the form, tamer in diſpoſition, and thriving with equal profit on leſs food.

From the drawing and deſcription of the *Mouſſlon*, a wild ſheep of Tartary, and ſuppoſed by ſome naturaliſts to be the primitive race; the Norfolk, of all our ſpecies, ſeems moſt like this original. A lean long head, large curved horns, a riſing back-bone; when ſtanding, the fore-legs ſtrait, the hinder bent inwards; ſtrong in his whole make; agile in his movements; and in look wild and bold. Neither this, nor any other provincial ſort, have been attèmpted to be reared to an higher degree of perfection, by perſeverance in culling, preſerving, and occaſionally croſſing the more peculiarly perfect ones of the breed, till the Leiceſterſhire Society aſtoniſhed the kingdom, (and I may ſay, all Europe) with their ſkill in the trial, their ſucceſs in the event, and the incredible return to their perſeverance and ſagacity, from the price paid by thoſe who moſt laudably aimed at ſharing in the pride and benefit of ſuch improvement. If any little artifice of trade hath been exerted in this extraordinary ſpeculation, the publick has probably ſhared fully in its reſult, by the ardour raiſed and excited to follow up ſuch an example, by equal attempts; which, if in other counties, more ſuitable for ſoil and ſituation for that purpoſe, can produce a finer ſtaple of wool on a carcaſe tolerably equivalent, will probably be ſtill more beneficial, in not only ſupplying the market with fine meat, but the manufacture with as fine wool.

[By Mr. Thompson, *Burford School.*]

The Zetland ſheep are ſmall, and diſtinguiſhed from other ſheep by marks unneceſſary to relate; are ſubject to few diſeaſes, and ſell at about five ſhillings a head. Each ſheep has about two pounds of wool, one fourth of which is very fine; the hatters in Edinburgh have offered four or five ſhillings per pound for it, but it ſells at one ſhilling per pound. The oldeſt ewes have the fineſt wool, but the coarſeſt is thought fine in Scotland. The number of ſheep may be about ninety thouſand, but might be increaſed to to four times that number. Five or ſix ſheep of the Zetland breed may be fed with the food of one Engliſh.

On the different Kinds and Properties of Wool.

[*By Mr.* Collins, *Devizes.*]

Surry.—*Banſted-Downs*; ſhort, thick, cloſe; I only ſaw it on the ſheep's back. *Common-Heath*; longer, yet ſoft, coarſer, much filth or hoar. *Sand-Heath*; fine, ſilky, full of white and black ſand.

Sussex.—*Down: South-Down*; ſhort, thick, inclined to harſhneſs. *Underhill*; the old ſheep kept one winter off the downs, and ſhorn in the ſummer, ſofter, but not ſo fine. *Weald*; falling wool, moſtly from the Underhill wool, deep combing, &c.

Hants.—*Foreſt*; ſmall, fine, filthy, ſandy. *Down*; larger, harſher. *Broken up*; larger and harſher ſtill, does not recover in a man's age.

Dorset.—*Down*; coarſe and deep. *Foreſt* or *Common*; fine, filthy, ſandy.

Wilts.—*Down*; fine, ſoft, clean, white, before the breaking up ſo much down, and the introduction of the large breed; now clean, white, coarſe, not ſoft. *Incloſure*; moſtly fatting, or to be put on fatting.

Somerset.—*Incloſed*; a deepiſh, thin wool, yellowiſh, ſoft, and ſilky. *North part*; thicker, ſhorter, not ſo fine, but good.

Glocestershire.—*South part*; large, deep combing, ſtrong, whitiſh, rather coarſe. *North part*; more on the fatting.

Monmouthshire.—*Foreſt* or *Common*; ſmall, yellowiſh, fine, healthy, and moſſy. *Incloſed*; ſmall, but larger, yellowiſh, fine, clean, thick matted, or trinded.

Herefordshire.—*Rye-Land*; thin, hungry, harſh, out of proof, worſe and worſe; in the *working* (or *ſand*) *ground* apt to be filled with the beards of the rye. *Incloſure*; thick, yellowiſh, the fineſt wool in general in the kingdom, but much worſe by mixture. *Foreſt* or *Common*; ſmall, ſoft, ſilky, and filthy.

Shropshire.—*Foreſt* or *Common*; ſmall, yellowiſh, ſoft, ſilky, filthy, moſt times thick-haired, (or cat's hair) yellowiſh.

Radnorshire.—*Foreſt* or *Common*; ſmall, whitiſh, thicker, harder, filthy, and ſome ſandy.

Berkshire.—Deep, ſtrong combing wool, (they wind it outſide outward.)

In the Iſle of Wight, the Down wool is rather finer than the Wilts.

Incloſures and large farms have gradually introduced a larger ſort of ſheep, and conſequently coarſer and deeper in the ſtaple, and in the ſame or greater proportion leſſened the quantity of ſhort or clothing wool, whether to the emolument of the community at large, or not, is a queſtion; my deciſion is on the negative ſide.

The *whim of the day*, the introduction of Mr. BAKEWELL's breed, has anſwered many people's ends, whoſe intereſt it was that this whim ſhould take place and be continued; but of a woeful experiment to many who purſued this whim; the introduction of the goggles, a diſeaſe not known to our unwiſe forefathers, but ſpread far and wide by their wiſer children; beſides thwarting the univerſal Diſpoſer of all creatures, who hath placed the ſmaller cattle, vegetables, &c. on the hills, and the larger in plains and low lands; and the folly of putting ſuch large rams to ſuch ſmall ewes is double folly, ſome having loſt the greater part of their flock thereby. The goggles have nearly overthrown the whim of large ſheep, introduced at firſt by ſome noblemen, or men who had large eſtates in their hands, and vied with each other who ſhould produce the largeſt and fatteſt cattle; which has been an aſtoniſhing injury to the community, viz. a ſmall or middling family could diſpenſe with a leg of mutton 5lbs. or 6lbs. but cannot on any account buy one of 14 or 15lbs. beſides the ſtrong, nauſeous, cadaverous taſte of the latter, compared with the fine flavour of the former.

Terms of art, if not well defined, will leave the reader, ſtudent, or hiſtorian, in the dark, or at leaſt liable to err.

WOOL. An uniform hair, protruded through the ſkin of an animal from a root, and which does not fall off without ſome violence, or diſeaſe in the animal.

FUR is an hair of a capillary nature, and uſually ſuch creatures have two coats, a ſummer and a winter one.—

Sometimes theſe are mixed, which is an inconceivable damage to the medley cloths, and ſeems to call for a remedy, if poſſible.

Fleece. The wool ſhorn off one ſheep, and wound up together by a band twiſted out of ſome parts of it.

Top. In the fairs at Hereford, &c. the ſame thing; though ſometimes (through avarice) the fleece is broke into ſeveral parts, and every one wound up is called a top, and the ſeller can ſuit himſelf as to the ſum of the ſcale. In trinded wool, which is wound up as cloſe as poſſible in the form of ſkittle-pins, each is called a top; and what is bound it up in rind of a tree, is called a ſtone or 12½ lbs. by which it is weighed, that being the draft.——Various drafts for wool: A pack in the country 244lbs.; when fit for uſe in London, 242lbs. In Romney-Marſh and Eſſex, part of Surry, Suſſex, and Hants, the wool-cloth is filled, and then weighed, deducting 4lbs. in every twelve ſcore, as cuſtomary allowance to the buyer. In Suſſex, the todd 32½ lbs. in Hants 31lbs. upright, or 30½lbs. turning. Reading fair, 29lbs. The ſtandard weight for clean wool fit for uſe, 30½lbs.; the ſtandard todd, 28lbs.; the weight in Wilts, 21½lbs. The ſtone at Hereford, &c. 12½lbs. much altercation between the buyer and ſeller about the half pound; the woolſtapler allows it on wool fit for ſale, and therefore it ſeems but reaſonable to have the ſame advantage when he buys, though that is far ſhort of an equivalent in the common Foreſt wool.

Staple. If a ſheep with a good coat on him walks, the wool *parts* in many places; if one of the partitions were to be plucked or cut off, that would be a ſtaple, and there are a variety of terms of art uſed on this occaſion; as long, ſhort, thick, thin, hovery or frothy, hard, harſhy, ſoft, ſmooth, clear, ſtrong, rotten, weak, colted, felted, matted, hitched, in the middle, or in the ground; in proof, or out of proof.—If combing wool is matted in the middle of the ſtaple, it will not open in the ſuds, and in combing will run almoſt to pinnels; if at the ground it will open, and is but of little harm.

Sorts. Combing we made only matching, and body (information ſays fifteen or ſixteen different ſorts) where the combing is tried, ſorted, or uſed, regarding the fineneſs of the hair, and the length of the ſtaple; there is a refuſe after combing left in the combs, called pinnels, uſed for *linſeys*. Short wool: we made eight ſorts of it, and thoſe uſed for various purpoſes.

SELLING PRICES ABOUT 1780.

Matching 11½d. to 12d. Body 8½ to 9d.

	Hereford.	*Shropſhire.*	*Southdown.*	*Wilts.*
Choice locks	2s. 6d.	2s. 0d.	1s. 9d.	1s. 6d.
Overlookings	1s. 4d.	1s. 3d.	1s. 1½d.	1s. 0d.
Middle fine	1s. 0d.	1s. 0d.	0s. 11d.	10½d.
Running fine	10½d.	10½d.	0s. 10d.	9½d.

Second, no diſtinction, 9d. Abb 8d. Warp 6½d. Liſt 5d.

BUYING PRICES.

Herefordſhire, ſtone from 18d. to 2s. Shropſhire, Radnorſhire, 12d. to 14d. South-Down, 25s. per todd, to 32s. Wilts, 9½d. to 10d. per lb. Hants, 22s. per todd.

Diſorders in ſheep. The rot or conſumption, the pelt-rot, or falling of the hair; on ſome the foot-root, called the gout; the hunger-rot or ſtarving; the goggles; the red-water, or dropſy; the ſtone; the fly or maggot; giddineſs; dog or pig's mouth; broken-mouthed; the worm in the tail; the ſhab, itch, or ſcab; lice, dog-worried, bit, or torn; the ſmall and large tick; the ſtaggers; the chill.

The wool of the ſheep does in a great meaſure diſcover the diſeaſed ſtate of the animal. In Smithfield market, the ſort, make, and wool, of different ſheep might be obſerved and compared with advantage.

The wool of thoſe Spaniſh ſheep which I have examined, is degenerated below the quality of the true South-Down wool. It is my opinion that moſt of the Suſſex ſheep introduced into Hants and Wilts, are already conſiderably degenerated, as to the wool, in ſhortneſs, fineneſs, and quantity.

There is a very remarkable quality in *black* wool, which is, that moth gets into it much ſooner than into *white*; and even if made into cloth, the moth cannot be eaſily kept out of it; but if the wool be dyed, that quality is deſtroyed.

Mention has been often made of "improvement in the breed of ſheep:" to me it appears a very vague phraſe, without any determinate meaning. If the farmer, or grazier, or butcher, gets more money by dealing in any particular deſcription of ſheep, they judge it an improvement, whether the quantity of wool, ſize of the ſheep, its fatneſs, or its tallow and pelt, be the moſt remarkable.

Yolk in wool ſeems to be the inſpiſſated perſpiration of the animal, but not ſweat; for that is watery and ſaltiſh, which would corrode the ſkin of the animal, as we experience in the water running from the eyes or noſe, excoriating wherever it runs; but the yolk ſeems to be of an oily nature, eaſily miſcible with water, and will ſcour almoſt as well as ſoap. The quantity, at a medium, of Hereford, Shropſhire, Suſſex, Wilts, is about half the weight of a yolky fleece; weight 3lbs.; the yolk in that fleece will be near 1½lb. which is the cuſtomary allowance to the wool-buyer; if any ſheep has eſcaped waſhing, and is ſhorn in the yolk, the farmer ſometimes orders ſuch fleece to be hard-waſhed, which does much harm, as it mixes the fine and the coarſe together, ſo that they are with great difficulty afterwards ſeparated from each other; and ſome out of covetouſneſs, near ſhearing time, ſhear the dead ſkin, and waſh that wool, which is worſe ſtill if it be uſed together, as it is a cauſe of extraordinary ſhrinking; but if in either of theſe caſes they would uſe it for blankets, mops, &c. for their own uſe, well and good.——*Nov.* 1795.

[*By Mr.* DAVIS; *June* 1795.]

From obſervations on the wool produced from different croſſes of ſheep with the Spaniſh ram, viz.

Horned Sheep,	*Polled Sheep*,
Dorſet,	South-Down,
Wilts,	AND
Mendip,	Ryeland,

the peculiar property of the Spaniſh wool, viz. the fineneſs of the pile, and the abundance of yolk contained in it, which keeps the wool moiſt to the points, ſeems to be communicated in a much greater degree to the horned ſheep than to the polled ſheep: the wool of the latter not appearing to be mended above one third, whereas that of the former is at leaſt one half better. Perhaps, as the Spaniſh rams are horned, and partake much of the properties of the old Dorſetſhire ſheep, the croſs may be more congenial than with polled ſheep.——Spaniſh wool abounding ſo much with yolk, ſhould not be waſhed on the ſheeps' backs; it hurts the ſheep, and after all, the wool cannot be got clean with cold water. It is ſhorn in Spain before waſhing.

[*By Mr.* COLLINS.]

With a view to improve the wool of a flock of ſheep, at ſhearing time take notice of the fleece when cut off. Look at the bottom or part of ſeparation; if it be *ſtitchy-haired*, mark that ſheep for ſale, or fatting, whatever other good qualities it may be poſſeſſed of. If thin of wool on the back, let that alſo be marked for ſale, or fatting; becauſe, when it rains long or hard, the water penetrates eaſily to the ſkin on the back, waſhes out the yolk, and chills the ſpinal marrow.——In the choice of your fleece for ſtock, avoid as much as poſſible a medium between combing and clothing wool; as ſuch would not be ſo uſeful for either purpoſe. Mark the ſheep bearing ſuch wool for ſale or fatting. If your ſheep has a very coarſe breech, mark it for ſale, or fatting. Separate all theſe, together with ſcabbed, giddy, fly-blown, foot-rot, dog's or pig's mouth, ſcouring, or any having an infectious diſorder, from the flock—and on no account whatſoever ſuffer them to be with it.

In the firſt choice of the ram or ewe, never go farther from your own farm, for any ram or ewe, than you can help. If your's be *down* land, buy from off the down; if incloſed, from the incloſed. Remember to buy from worſe land, if poſſible, than your own, becauſe there is a greater probability they will thrive in your keeping; but take care not to keep them too well, as that may be attended with great inconveniencies, if not with loſs; for a ſheep ſhould work hard for its maintenance whilſt in the flock, yet not be pinched. Search the coat of the ram narrowly, to avoid a *ſtitched-haired* fleece; for this would ſo damage your wool in two years, that it could not be recovered again, without changing your flock, in twelve or fourteen years. Again, however handſome the ſhape, however fine the wool, reject him if he has not a *cloſe thick* coat (in which is plenty of yolk, a certain ſign of health) along the back. The ſame care ſhould be uſed in chooſing the ram, whether for combing or clothing wool. Buy your ram a little before ſhearing-time, if you can; not at any fair or market, but at the farmer's houſe; for then you will ſee the ram as he is, without being ſhorn or trimmed by the *ſheep-barber*, purpoſely for ſale; then you will alſo know the depth, or length, of the ſtaple; the ſhorter, finer, and thicker it is, the better for clothing-wool; the longer, thicker, and finer, the better for combing-wool. As to the ewes, they are rather to be raiſed out of your own flock, than bought in from elſewhere; as they will be more naturalized to the ſoil, and other circumſtances peculiar to the farm.

When a ſheep dies, get a ſurgeon to open or diſſect it; get him to make his remarks as he proceeds, you noting them down in a book provided for that purpoſe: thus do for two or three ſheep in every diſorder; you will thereby acquire ſkill enough to examine a dead carcaſe by yourſelf.

The *rot*, or conſumption, is frequently the effect of a cold, to which ſheep are very liable who have thin coats, and lodge on wet lands; as appears by their frequent coughing. How the *flukes* get into the liver, I can no more account for than how various kinds of worms are bred in the human body The queſtion *how?* in many caſes, is very difficult to be anſwered, notwithſtanding the fact may be certain.

The *pelt-rot*, or falling off of the hair or wool, ariſes, 1ſt, From a ſudden alteration from a ſcanty to a *full feeding*:—2dly, From a *partial fever* in the ſpot where it falls off, on the neck, ſhoulders, the back, or the rump:—3dly, The *ſhab*, looſening it at the ground:—4thly, *gangreen*, or ſphacelus, which the falling off of the wool diſcovers.

The *foot-rot*, or by ſome called the *gout*, is ſaid by moſt farmers or ſhepherds to be infectious. The beſt informa- I can get concerning this is, that between the claws of the fore-feet (as I do not find it attacks the hind-feet) a ſwelling is perceived, which tends to ſeparate the claws in ſome degree. On ſqueezing or lancing it, a *hairy worm* is taken out—the place being anointed with ſome ointment, and bound up for a few days, the cure is effected.

The *hunger-rot* generally proceeds from the farmer's poverty or covetouſneſs, in giving very bad hay for their winter proviſion, which they do not eat.

The *goggles*, a diſorder unknown to our anceſtors, but, by comparing the different accounts of the effects together, appears very plainly to me to be a paralytic ſtroke, affecting the ſpinal marrow; but whether I am right or wrong in my conjecture, time may diſcover.

The *red-water*, or the dropſy; as the animal ſwells, the blood almoſt ſerum, watery bladders in different parts, chiefly in the fore-part of the animal's body, and the ſkin when ſtript off has red ſpots in various parts and of various ſizes. My conjecture is, that the wool, uſually called *frothy*, is owing to this diſorder; a *want of yolk*, *dryneſs*, *harſhneſs*, *thin and weak ſtaple*, ſoon becomes dead, little or no proof; on breaking it *cries out*, and much duſt flies off. All theſe ſymptoms are to be found in wool, where the ſheep are fed conſtantly on a very light, ſandy, arable ſoil, as Urchinfield, Herefordſhire.

The *ſtone* is not a common diſorder; I have never heard but of one inſtance of it.

The *fly* or *maggot*; if this happen before ſhearing, the ſheep is indiſpoſed, and does not yield a proper quantity of yolk, and thus it becomes a proper nidus for the fly to ſpit its eggs in, which are ſoon hatched by the heat of the body. The maggots immediately feed on the fleſh of the ſheep; but if they are not deſtroyed by applying tar, or ſome other known remedy, to the aggrieved place, (a good proverb, not to loſe the ſheep for a pennyworth of tar) they increaſe ſo faſt in number and ſize, that the ſheep itſelf is ſoon deſtroyed.

Giddineſs. This is ſaid to ariſe from a worm, or maggot, under the horn, on either ſide, and that the turning round is the effect of this worm or maggot.

Broken-mouthed. A manifeſt ſymptom of age and decay.

The worm in the tail. The hair drops off, the animal reſtleſs, frequently rubbing the part affected, hindered from eating quietly its food by ſmart or pain.

The *ſhab*, *ſcab*, or *itch*, ſaid to be infectious. I am told there are living inſects, whether of the ſame form as in the *human* itch I do not know; once I ſaw a ſcabbed ſheep waſhed with human urine, the conſequence whereof was, that in a day or two the ſcab ſpread ſo far as the ſkin was wetted with the urine. The uſual remedy is tobacco ſteeped in water, (called ſhab-water) with ſome oil or ſpirit of turpentine added thereto, and the aggrieved part waſhed therewith. But as it is always uſed with oil or ſpirit of turpentine, it ſeems to me probable that the *turpentine* is the ſpecific, properly lowered down with water, according as the caſe may require. I am juſt now informed by a farmer, that his ſhepherd gets ſtrong tobacco and flour-ſulphur, and boils in the meat-brine, and afterwards puts into it ſome oil or ſpirit of turpentine; uſing it without any water, and by applying it in ſmall quantities, finds it effectual.

Small and large Tick. Theſe abound moſt with the animal that is diſeaſed, and may therefore be conſidered as a ſign of unhealthineſs. An abundance even of the ſmall ticks gives the wool a yellowiſh greeniſh colour—the fineneſs and ſoftneſs is increaſed thereby. The large tick I have only found in the Suſſex and Herefordſhire wool; in the latter, I have never found any harm therefrom; but in the Suſſex wool and ſheep it produces much harm to both.

The *ſtaggers.* This diſorder attacks lambs; if diſcovered in time, the ſhepherds frequently bleed them in the eye-vein, and thus a cure is obtained.

When ſuch a multitude of ſheep died after ſhearing in June 1795, I found by enquiry they were of the beſt ſtouteſt, and healthieſt ſheep; as the weather was ſevere, they, to get away from it, got ſo cloſe together, that they were ſtifled; whereas the weaker, not being able to thruſt in ſo cloſe, eſcaped with their lives, as very few indeed of the latter, in compariſon to the former, died.

The *laſk*, or *ſcouring*. Query. If from too-moiſt food, indigeſtion, griping, or what other cauſe? If not ſtopped, it generally proves mortal.

Preſervation of the Health of Sheep.—Let the farmer frequently look over his flock, and ſee that their tails are kept clean. Never ſuffer them to lodge two nights in the ſame fold; it is better to fold over twice than to do thus. I am informed, ſheep taint where they have been ſooner than other animals, perhaps becauſe of their numbers.——A very common diſorder ewes are liable to after yeaning, is *a ſtoppage in the lacteal ducts of the udder*, ſometimes in that leading to one of the nipples and ſometimes to both; the udder ſwells univerſally with partial hard knobs, which ſoon bring on an inflammation; and if not ſtopped, perhaps in the courſe of 24 hours, part if not the whole of the udder mortifies. The intention is to ſtop the mortification. The proceſs of cure is—to clip off the wool as cloſe as poſſible, to open with a razor, or other very ſharp inſtrument, the principal lacteal duct or ducts, to ſqueeze out the morbid matter, and put in a little freſh butter; to keep the ſheep ſeparate from the flock. The ewe frequently loſes the uſe of one teat, and ſometimes both; if but one, ſhe will maintain the lamb; if both, the lamb to be taken from her, and the ewe fatted.

Query. What is the *yolk* of a ſheep? Its proper quantity? Its uſe both to the ſheep and the wool? Its effects as to a redundancy or deficiency to the ſheep and its wool? If ever a total want of it? If the like to be found in any other animal? Whether ſheep ever ſweat?——*Dec.* 1797.

[*By Mr.* FRANKLEN.]

Sheep are ſhy of food they are not uſed to eat, but hunger will bring them to eat moſt things fit for them. They are remarkably fond of *Roota-Baga*, which are leſs ſpongy and more ſolid and ſweet than the common turnip in April. I have this year kept them very good in the ground till I had a good bite of vetches, clover, and rye-graſs; the leaf is ſmooth like the cabbage tribe, and the ſheep are very fond of them.

When I was writing this, I found in your ſecond volume a letter from Mr. Wimpey, (Obſervations on Dr. Tiſſot's Letter) recommending the houſeing of ſheep and lambs in winter, to avoid a kind of wind-colic, which kills a great number of the fatteſt lambs when the nights begin to be cold and froſty. I have for many years ſaved my lambs much better than my neighbours, by houſeing them, and giving them hay after drenching them with tar, butter, and garlick, which makes them lax for a day or two. They have a cuſtom in Lancaſhire, of rubbing tar and butter on the ſkins of ſheep, which they call ſalving, to thicken the wool, and preſerve them from the ſcab. I have not heard of this practice in the ſouthern parts of this iſland.

I think that ſmall ſheep, ſhort ſweet paſture, and ſhelter from rain and ſnow, are all eſſential to produce very fine wool; but the ſize of the animals muſt ſuit the richneſs of land to yield the farmer profit.——*April* 1791.

On DISEASES of SHEEP.

[ANONYMOUS.]

Within theſe few years we have had a diſeaſe among the ſheep, now generally known by the name of the *Goggles*; a diſeaſe which has deſtroyed ſome in every flock round this country, and made great havock in many.

The ſheep moſt ſubject to the goggles are *two-teeth.* It is not infectious, but hereditary, and undoubtedly runs in the blood. It has no affinity with giddineſs, for they do not run round. It moſt reſembles the ſtaggers in lambs; with this difference, that whereas ſtaggery lambs ſhew weakneſs before, and fall forward, goggly ſheep ſhew a weakneſs behind, and fall backward, when forced to run. When firſt obſerved to be diſeaſed, their ears drop, and they rub their tails much more than other ſheep; they then diſcover the weakneſs above-mentioned, and grow poorer and weaker till they cannot drag their limbs behind them, and at length die. I have examined a few, and found the viſcera all ſound. I have blooded one, and found no inflammatory cruſt. I can neither myſelf imagine, nor find one who can venture even to conjecture the cauſe.——*Wilts, May* 1779.

[*By a Norfolk Farmer.*]

After a wet harveſt, a great quantity of ſelf-ſown barley comes up in October. As the ſheep then run at large, they are very fond of this crop, but it often proves fatal to them. The cold dews in the latter end of October, and the fogs in November, generally hang in drops on the blade of this ſelf-ſown crop, longer than on the reſt of the herbage; and the plants themſelves, being of a cold watery quality, are thereby rendered ſtill more unwholſome. After feeding on it for about a month or ſix weeks, the ſtock-lambs grow dull and heavy, rub themſelves more than uſual, loſe their appetite, and waſte till they die.——After they are once viſibly affected, removing ſeldom ſaves them. The fleſh of ſuch as are killed appears looſe and flabby. The viſcera is of a livid hue, and very watery; the liver is greeniſh, and full of ſmall knots or kernels; the blood is viſcid, with a watery ſediment, and very ſoon turns putrid. As ſoon as the ſymptoms appear, they are blooded below the eye: this, in the firſt ſtage of the diſorder, is ſometimes effectual; but no other remedy has yet been diſcovered. The diſeaſe does not appear to be infectious; nor are either the ewes or wethers much ſubject to it.

[*By Mr.* PRYCE.]

Mr. A. Young and many others attribute the rot in ſheep to moiſture, but it will be difficult to account for the rot being taken on fallows in a ſingle day, and in water-meadows ſometimes in half an hour; when in grounds of a different ſort, although exceſſively wet and ſlabby, ſheep will remain for many weeks together uninjured.—Another opinion, which has many adherents, is that the rot is owing to the quick growth of graſs or herbs that grow in wet places.

Without premiſing that all-bounteous Providence has given to every animal its peculiar taſte, by which it diſtinguiſhes the food proper for its preſervation and ſupport, (if not vitiated by fortuitous circumſtances) it ſeems very difficult to diſcover, on philoſophical principles, why the quick growth of graſs ſhould render it noxious.

Is it improbable, that ſome inſect finds its food, and lays its eggs, on the tender ſucculent graſs found on particular ſoils, (eſpecially wet ones) which it moſt delights in? Or that this inſect ſhould, after a redundancy of moiſture, by an inſtinctive impulſe, quit its dank and dreary habitation, and its fecundity be greatly increaſed by ſuch ſeaſons, in conjunction with the prolific warmth of the ſun? The eggs depoſited on the tender germ are conveyed with the food into the ſtomach and inteſtines of the animals, whence they are received into the lacteal veſſels, carried off in the chyle, and paſs into the blood; nor do they meet with any obſtruction until they arrive at the capillary veſſels of the liver. Here, as the blood filtrates through the extreme branches, anſwering to thoſe of the *vena porta* in the human body, the ſecerning veſſels are too minute to admit the impregnated *ova*, which, adhering to the membrane, produce thoſe animalculæ that feed upon the liver, and deſtroy the ſheep. They much reſemble the flat fiſh called plaice, are ſometimes as large as a ſilver two-pence, and are found both in the liver, and in the pipe (anſwering to that of the *vena cava*) which conveys the blood from the liver to the heart.

It ſeems to be an acknowledged fact, that ſalt-marſhes never rot. Salt is pernicious to moſt inſects; they never infeſt gardens where ſea-weed is laid. Salt and water is a powerful expellent of worms bred in the human body. Liſle, in his book of huſbandry, informs us of a farmer who cured his whole flock of the rot, by giving each ſheep a handful of Spaniſh ſalt, for five or ſix mornings ſucceſſively. The hint was probably taken from the Spaniards, who frequently give their ſheep ſalt to keep them healthy.——*Dec.* 1779.

Mr. Arthur Young's obſervation, that "the accounts of "the diſeaſe called the Rot in Sheep, are ſo amazingly con-"tradictory, that nothing can be gathered from them," is as true as his concluſion is, "that moiſture is the cauſe;" and in this opinion I am confirmed as far as a ſingle inſtance can confirm me. It was in the caſe of a paddock adjoining to my park, which had for ſeveral years cauſed the rot in moſt of the ſheep which were put into it. In 1769, I cauſed it to be under-drained with covered drains, which have worked well ever ſince, effectually curing its wetneſs; and notwithſtanding I have ſince kept my ſheep in it, I have never killed one whoſe liver has been at all affected.

J. B.

[*By Mr.* J. C. *of Street.*]

That the Rot is occaſioned by the inſects found in the liver, and which are called flukes, is very evident; but to account for their coming into the liver is not ſo eaſy. I am of the opinion that they are ſwallowed with the ſheep's food, while in the egg ſtate. The common or moſt obvious objection to that opinion is, that this inſect is never found but in the liver, or ſome parts of the viſcera, of ſheep that are diſeaſed more or leſs; and that they muſt therefore be bred there. But this objection will loſe its force, when we conſider that many inſects undergo ſeveral changes, and exiſt under forms extremely different from each other. Some of them may therefore appear, and be well known under one ſhape, and not known to be the ſame under a ſecond or third. The fluke may be the laſt ſtate of ſome aquatic animal which we at preſent very well know under one or other of its previous forms.——On killing a ſheep lately, which was ſeemingly in good health, I examined the viſcera carefully, and in ſome of the paſſages leading to the liver (which appeared turgid) I found a whitiſh thick liquor, which appeared to be all in motion. On applying a pocket-glaſs, I found it contained thouſands of theſe flukes, which were apparently juſt hatched, and about the ſize of mites. Theſe, if the ſheep had not been killed, would probably have ſoon obtained their uſual ſize, and proved its deſtruction.

[*By Mr.* J. Webb, *of Doynton; Oct.* 1786.]

I have ſeen ſeveral ſheep, immediately after being ſhorn, appear to be in violent pain; their ſides are ſomewhat extended, and their breathing very ſhort; the head is hung drooping, and they have a great averſion to moving or walking, and generally lie down. Theſe ſymptoms continue increaſing till the ſheep dies in a few hours, unleſs a violent purging come on, which generally gives immediate relief. On enquiring for the name given to this complaint, I found it was called *the Wind*; but where the ſeat of it lay, few could tell. On opening four ſheep that died of the diſeaſe, I found all the inteſtines rather diſtended with *flatus*, but not in any great degree. Their blood-veſſels were very turgid, and of a deep red, particularly thoſe of the large inteſtines, excepting the *rectum*, (or what is commonly called the *bum gut*) which had a healthy appearance, as likewiſe had the ſtomach, melt, caul, liver, heart, lungs or lights, &c. and in ſhort all the *viſcera* contained in the cavity of the trunk. From theſe appearances I will venture to ſay, that the diſeaſe in queſtion is a violent inflammation of the inteſtines; perhaps in ſome meaſure ariſing from bruiſes in ſhearing, but more ſo from loſing a warm clothing, and being ſuddenly expoſed to cold air and cold feeding.

I beg leave therefore to recommend to farmers, that on the firſt appearance of the complaint, they put the ſheep into a ſtable or other warm place, and immediately bleed it very freely. Bruiſe a quarter of an ounce of ſome carminative ſeed, ſuch as carraway, aniſe, cummin, or fennel, and mix theſe with two ounces of Glauber's purging ſalts in a pint of water; place it on a fire, and make it boil for a few minutes, then ſtrain it off: then add a quarter of an ounce of powdered jalap, and while lukewarm give the ſheep a quarter of a pint (firſt well ſhaken together) every half hour till it dungs. It ſhould have no food or cold water till recovered; a little warm water might be of ſervice,

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[*By Mr.* POTTICARY, *Wiley, Wilts.*]

In our county we breed many ſheep, and manure the fallows, &c. with them. After having penned them all night, when they are driven into freſh graſs, or young clover, they are frequently taken with what we call the *Blaſt*; that is, they over-gorge themſelves, foam at the mouth, ſwell exceedingly, breathe very quick and ſhort, then jump up, and fall down dead inſtantly. This is ſo frequent a diſorder, and ſo great a loſs, that a neighbour of mine had ſeventeen die in one morning—indeed within half an hour; for they are often taken with it many at a time. We have no remedy, ever known as yet, but driving them into a bare place like a road, and keeping them in motion; but it is ſo ſudden, there is not time for that in general. It is a diſorder not unfrequent in cattle; and having a cow taken in this manner, I had heard that, by ſtabbing her in the maw, I ſtood a chance of ſaving her life—I did this; the matter flew out, gave inſtant relief to the cow, ſhe did well, and has had two calves ſince. I therefore reſolved to try the ſame with my ſheep, and have ſucceeded to my wiſh. The way I perform it is as follows:—

The ſheep will ſwell conſiderably on the left ſide (or what you would call the nigh ſide of a horſe) near the kidnies, behind the ribs, which is near the flank; the ſwelling is very protuberant, and there is mark enough, (about three inches) where if you dart your knife in, you muſt *at this time* go inſtantly into the maw; the food or matter inſtantly flies out, gives relief, and with only common applications of a horſe-doctor's mixture of bees-wax, reſin, greaſe, &c. the ſheep is ſure to do well.——*May* 1787.

[*By Sir* THOMAS BEEVOR.]

The diſeaſe called the *Scab* in ſheep is generally found moſt prevalent where the lands on which they are kept are wetteſt, or in the moſt rainy ſeaſons. The beſt way, therefore, to treat this diſorder is, on its firſt appearance, to give the ſheep ſomething inwardly to drive *out* the eruption; and then external applications are made with propriety, and generally with ſucceſs.

Take a gallon of ſoft well or pond water, and divide it into two equal parts. In one pint diſſolve eight ounces of old hard ſoap, to which, when diſſolved, add two ounces of ſpirits of hartſhorn, and half a pound of common ſalt, with four ounces of roll brimſtone, finely powdered and ſifted. In the other part of the water put two ounces of leaf tobacco, and one ounce of hellebore root. Boil this ſecond part till you have a ſtrong infuſion, and then ſtrain it off.—Next take that part of the water firſt mentioned, and ſet it over the fire; let it boil half an hour, ſtirring it all the while with a wooden ladle. In the mean time heat again the ſecond part, in which the tobacco and hellebore were infuſed; and when hot mix the two parts gradually together over the fire, keeping the mixture ſtirring all the time, which ſhould be about a quarter of an hour. When quite cold, put in a ſtone bottle for uſe, and ſet it in a cool place—Then take four quarts of new ale or beer, put into it twelve ounces of ſalt, two ounces of bay-ſalt, and eight ounces of pounded nitre, together with twelve ounces of pounded roll brimſtone. Set them over a gentle fire, and when the ale boils take off the ſcum. When it has boiled half an hour, ſet it by to cool; and when cold put it in a ſtone bottle for uſe.

When you are thus far prepared, take one quart of ale, and ſet it on the fire, mix into it by degrees three ounces of ſulphur; when juſt ready to boil, take it off the fire, and let it ſtand to cool; and when only blood warm, give this qantity inwardly to three ſheep. Repeat the doſe three times, allowing one day's interval between each doſe. This will drive out the diſorder, and *then* the *firſt* mixture is to be rubbed on the diſtempered parts; and two days afterwards the *ſecond* mixture, and ſo on alternately for eight or ten days, till the cure is effected. Sometimes two rubbings will be ſufficient.——The objection to this mode of cure is, that it is compound, troubleſome, and rather expenſive. On this account ſome perſons have adopted the following method of treating the diſeaſe, and with ſucceſs alſo:

Take half an ounce of good corroſive ſublimate, and diſſolve it in two quarts of rain-water, to which add a common gill glaſs of ſpirits of turpentine. When the ſheep is ſtruck, make a circle round the maggots with ſome of the water, dropping it out of a bottle; this will prevent their getting away, and hiding themſelves among the wool. Then drop a little among them, and rub it about with the finger, which will preſently kill them.——*March* 1781.

On the EPIZOOTY, *or Contagious Distemper among Horned Cattle.*

[Tranſlated from the French of Monſ. DE SAIVE, by Mr. MOREAU, of Bath.]

THE moment any ſymptoms of the diſtemper are perceived, about a pint and a half of blood ſhould be immediately taken from the beaſt, except he has been ill a day or two, in which caſe he muſt not be let blood; but in both caſes let the following draught be given him:

No. I. An ounce of the beſt theriaca (Venice treacle) diſſolved in a pint of vinegar; after which the back bone and the whole hide muſt be well rubbed with a dry hair cloth, to heat the hide and promote perſpiration. No drink ſhould be given him but a white drink compoſed of

No. 2. A handful or two of rye-meal, in a pailful of clear water; and, ſhould the beaſt ſeem to want food, mix up ſome crumbs of rye-bread with ſome of the ſaid white drink, and give it him. The animal's mouth muſt be waſhed twice a day with a cloth dipped in a mixture of

No. 3. Vinegar and water, (equal quantity of each) with a ſpoonful of honey to a pint of it.

If on the ſecond day the beaſt has not dunged, a clyſter compoſed of

No. 4. A pint of water in which bran has been boiled, two ſpoonfuls of ſalt, and a ſmall glaſs of vinegar, muſt be given every day till the evacuations are natural and regular.

Beſides the above remedies, the following cordial mixture:

No. 5. A pint of clear water, the ſame quantity of vinegar, four ſpoonfuls of honey or ſyrup, and two glaſſes of brandy, muſt be given four times a day, to facilitate and keep up perſpiration; taking care to repeat the friction as directed above.

Should the beaſt ſtill continue low and heavy, the draught No. 1. muſt be repeated, unleſs he ſhould be hot and thirſty, in which caſe uſe only the drink No. 2. On the fourth day, if he ſeems more lively and free from heat, purge him with

No. 6. Two ounces of ſalts, and one ounce of common ſalt, diſſolved in a pint of lukewarm water, with two ſpoonfuls of honey. If this does not procure four or five evacuations, repeat the clyſter the ſame day.

This mode of treatment muſt be continued without intermiſſion till the beaſt begins to eat; then you muſt only give him the white drink No. 2, and a little good fodder; or, ſome rye-bread dipped in ſtale beer, moderately ſweetened with honey or ſyrup.

The exterior treatment conſiſts in the application of ſetons in the beginning of the diſtemper, at the bottom of the dewlap, and of cauteries towards the horns, between which a ſtone of a pound weight, or more, wrapt up in a cloth, muſt be fixed, to keep it ſteady. This is neceſſary to keep the head warm. But above all, the friction muſt be cloſely attended to, in order to determine the critical efforts of nature. It would be well alſo to evaporate vinegar in the cow-houſe, &c. and if it could be done without riſque, blowing of a few grains of gunpowder twice a day in them, would be a very uſeful fumigation.

If, notwithſtanding theſe aids, the beaſt be not perfectly cured in ten or twelve days, they muſt be continued without bleeding, unleſs the inflammation be very conſiderable; but if, after all, the diſtemper does not give way, the beaſt muſt be killed, and then too much care cannot be taken to bury it very deep, cover it over with the earth which came out of the hole, and lay turf over all, in order to prevent the putrid vapours which exhale from ſuch carrion, corrupting the air, and ſpreading the infection.

As to the preſervatives from infection, the principal (after having taken every precaution poſſible to prevent its communication from other herds) conſiſts in waſhing the racks, troughs, &c. and the hide of the beaſt every day, with plenty of water; and, as the generality of people ſeem to place great confidence in ſtrong aromatic fumigations, they are adviſed, inſtead of the expenſive drugs of which ſuch fumigations are compoſed, to uſe fires made with the branches of green wood, throwing pitch on it to quicken the flames and perfume the air; theſe fires muſt be lighted at ſome diſtance from the houſes, for fear of accidents. Common ſalt, given in ſmall quantities every day to horned cattle, is reckoned an excellent preſervative.

Though the report of an Epizooty is often ſpread, yet all the diſorders to which cattle are liable ſhould not be attributed to this epidemical diſtemper, ſince they are not exempted from this even when not affected with any contagious diſtemper. Therefore, when a beaſt is taken ill, enquiry ſhould be made if the infection be in the neighbourhood, as in ſuch caſe, a ſuſpicion of its being the Epizooty would be well grounded, and immediate recourſe ſhould be had to the remedies above-mentioned.

On CALVES and OXEN.

MR. Whitby, of Wallington, Norfolk, between the 1ſt of December 1776, and the 1ſt of April 1777, weaned, and reared on his farm, ten cow-calves and thirteen bull-calves, by the method following:—At three days old they were taken from the cows, put into a ſhed, and fed with ſkimmed milk for one month, allowing three quarts to each calf morning and evening. When a month old, they were fed with the like quantity of milk and water, morning and evening, with hay to feed on in the day-time, and at noon they were fed with oats and bran equally mixed, allowing half a peck to one dozen calves. At two months old, they were fed only in the morning with milk and water; they had hay to feed on in the day-time, and at evening (inſtead of noon, had the ſame quantity of bran and oats, with water to drink. They were fed in this manner until the middle of April, when they were turned out to graſs all day, and taken into a ſhed at evening, and fed with hay until there was plenty of graſs, and the weather grew warm. Such of the calves as were weaned in March were continued to be fed with milk and water every morning until Midſummer.

[*By Sir* Thomas Beevor.]

A farmer at Wreningham in Norfolk, had for many years weaned his calves from ſucking the cows at about ſeven or eight days old; he then gave them ſkimmed milk for about ten or twelve days more, with a few turnips cut into three or four pieces each, which they ſoon learned to nibble and eat; after which he turned them into the turnip-field without any further care or trouble than carrying them a ſmall bunch of freſh barley or oat ſtraw, night and morning, which he always obſerved to lay under ſuch hedge of the field as was then moſt ſheltered from the wind; that he turned them out in any month; in January, or ſooner or later, as they happened to be calved; that he never loſt any of them, never had any of them louſy, or that ſeemed to require more care or attention about them.——*April* 1783.

[*By Mr.* Crook, *Tytherton*; *Dec.* 1789.]

In the year 1787 I weaned ſeventeen calves, in 1788 twenty-three, and in 1789 fifteen ditto. I bought in 1787 three ſacks of linſeed; I put one quart of the ſeed to ſix quarts of water, which, by boiling ten minutes, became a good jelly; this jelly is mixed with a ſmall quantity of the tea of the beſt hay ſteeped in boiling water. Having my calves drop at different times, I did not make an exact calculation of the expence of this hay-tea, but out of my three ſacks of ſeed I had better than two buſhels left at laſt. I gave them the jelly and hay-tea three times a day; to the boy who looked after them 6d. a day; the price of the linſeed was 4s. 6d. per buſhel; the whole three years' ſeed 2l. 5s. My calves are kept in a good growing ſtate, and are much better at this time than my neighbours' that are reared by milk; they do not fall off ſo much when they come to graſs.

[*By Mr.* SMITH, *Ozelworth, Glocestershire.*]

It is well known that the cow does not give her milk for the maſter, but for her calf. I would therefore adviſe, that for the firſt year the calf ſhould go with the mother, till they both part by conſent. Afterwards, when ſhe calves, let the calf be taken from the mother as ſoon as dropt, and never let them come together again. In the uſual method of letting the calf ſuck the cow for a time, and then taking it away, the cow retains her milk in hopes of ſeeing her young one again; but in a few days her udder gets hard, and ſhe cannot part with her milk freely, were ſhe ever ſo willing. This is one great reaſon why we ſee ſo many cows with hard unſightly udders.——Let any gentleman of fortune that likes to ſee good cattle on his farm, get good heifers and a good bull. At the uſual time let them go together, and when the calves drop, never take them from the dam till they part by conſent. Try this method for half a dozen times, and ſee if any of thoſe heifers have hard naſty udders, as the butchers term them. If, when they calve, more milk ſhould be left in their udders than the calves can take off, let that be taken away by the milker. In ſix weeks that trouble will ceaſe, as the calf by that time will take all the milk any cow can give.

Query, Whether retaining the milk is not the reaſon why cows are more ſubject to the yellows than other cattle?——If at any time a good milch cow ſhould go dry before her milk is gone, get a young calf and put it to her, in order to preſerve her milk againſt another year; for it is well known, if a cow goes one year dry, nature will loſe its power of acting for the future.

[*By Mr.* KEDINGTON, *Rougham, Suffolk.*]

Oxen are kept at much leſs expence than horſes. The value of a horſe declines every year after he is ſeven years old; and is ſcarcely any thing if he is blind, incurably lame, or very old. But if an ox is in any of thoſe ſituations, he may be fatted, and ſold for much more than the firſt purchaſe; and will always fat ſooner after work than before. They are not ſo liable to illneſs as horſes; I never have had one indiſpoſed. Horſes (eſpecially thoſe belonging to gentlemen) are frequently rode by ſervants without their maſter's knowledge, and often injured by it. Oxen are in no danger of this kind. A general uſe of oxen would make beef, and conſequently all other meat, more plentiful; which I think would be a national benefit.——Working oxen with a yoke ſpares a conſiderable expence in the article of harneſs; but they move ſo much more freely with collars, and can be uſed with ſo much more advantage ſingly by the latter method, that I think it far preferable.——*Dec.* 1781.

On SWINE.

[*By Mr.* WINTER.]

FROM experience I find that ſwine prefer lucerne to clover; but neither lucerne nor clover are of themſelves a ſufficient ſupport for ſwine. A ſmall quantity of corn, peaſe, or beans, (particularly in cold mornings) is eſſentially neceſſary to be given them before they are turned out. Such food will warm and ſtrengthen their ſtomachs, and prevent the bad conſequences of a diſorder generally called *the blood*; which proceeds from the real want of a ſufficient quantity of blood, ariſing from the want of ſolid nouriſhing food.

I have applied potatoes in different modes for feeding ſwine; giving them whole, or maſhed in the water wherein they were boiled; or the laſt mode with barley-meal ſcalded and mixed in the trough. But from various and repeated experiments, I have found the following the moſt profitable method of applying potatoes, to not only the *rearing*, but likewiſe to *fattening* of hogs; varying the quantity given according to the circumſtances of rearing or fattening.

When rearing, a ſmall quantity of food given once or twice a day, with lucerne, clover, graſs, and offals, is ſufficient. When fattening, a conſtant ſupply is eſſentially neceſſary, ſo as not to leave the troughs incumbered with ſtale meat, which ſhould be cleared out, and given to ſtore ſwine.

An iron furnace is the moſt ſalutary for boiling potatoes. The method I have lately adopted, and always ſhall purſue, until a better be pointed out, is to fill about three parts of a furnace with potatoes; when in proportion to every five buſhels of potatoes, I ſcatter over them about a peck and a half of barley-meal, then fill the furnace with potatoes, adding juſt as much water as will cover them. By this method, the barley-meal does not ſink to the bottom of the furnace, where it will encruſt and burn, nor will it be liable to be waſted by being boiled over. The nouriſhment of the barley is in a great degree extracted by the water. After the potatoes are well boiled, let the whole be mixed and bruiſed together in tubs, with a clean ſpade, ſo as to form a pulp. By this method, all the nutritive properties of the barley and potatoes are incorporated, and thereby much eaſier digeſted, and the hogs require no water.

Swine, when fattening, ſhould be kept as clean as poſſible, and well ſupplied with dry litter. As their pens are generally too ſmall to admit of exerciſe, and as they immediately lie down after feeding, I have thought it neceſſary, twice or three times a week, to add about three table ſpoonfuls of ſalt to a half buſhel pail of food, which aſſiſts digeſtion, conſolidates their food, and increaſes their appetites. When too great a quantity of ſalt is given, it then acts as a purgative, which prevents their food conveying the neceſſary nouriſhment. About once a week, I have mixed two table ſpoonfuls of madder, which prevents obſtructions, acting as a diuretick, and is at the ſame time an aſtringent. And on ſome other day in the week, I give a ſpoonful or two of an equal quantity of flour of ſulphur, and ſalt-petre, well pounded and mixed; which purifies and cools the blood. All theſe different articles added to each pail of food in the morning, on ſeparate days, entirely prevent the meaſles, keep ſwine extremely healthy, and fatten them more expeditiouſly.——I muſt further obſerve, that hogs from the age of twelve to eighteen months are the moſt advantageous to be fed for bacon; as they have then attained their full growth, will require leſs food, and fatten much more expeditiouſly than hogs that are younger.

Mr. Franklen, in a letter to the Secretary, April 1791, ſays he found raw potatoes as nouriſhing for hogs as boiled.

[ANONYMOUS.]

Obſerving that hogs in general are very fond of clover, I made trial of a fold conſiſting of forty ruddle-gates of eight feet and half length each, pretty cloſe at the bottom, on the clover ſtubble, and put ſeventy hogs of different ages into it, allowing them ſix or ſeven buſhels of potatoes in the day in their fold at firſt, and ending with ten, which, with the young clover, was as many as they would eat; and I folded this year eleven acres of clover ſtubble, between the 19th of

September and the 1ſt of November. The hogs are always driven into a yard at night and littered, as the coldneſs of the weather might otherwiſe cramp them; and towards the end of October a very few beans are given in the fold, when they firſt go into it. The hogs do not gain much in the fold as to fleſh, yet they improve conſiderably in growth, and the good effects of the fold in the ſecond crop of wheat is ſo evident, that I have no doubts of the propriety of continuing the practice.

[*By Mr.* WICKINS, *Pondhead, near Lyndhurst.*]

Taking care to have my pigs firſt well wrung, I then have a pretty large fold prepared for them upon my potatoe-ground, into which they are driven every evening; and over every fold I order a ſprinkling of good old horſe-beans. Here they well fill themſelves. They lie warm and dry upon the haulm of the potatoe, and by leaving behind them a great quantity of the fineſt and ſtrongeſt dung upon the ground, they amply repay what they take away from it. If the potatoe-ground be dry, and not eaſy for their working the potatoes, a light plough muſt be run over it to facilitate this buſineſs, and *they* will do all the reſt.——*Oct.* 1798.

FOOD for CATTLE.

[ANONYMOUS.]

LINNÆUS, in a journey to Dale-Carlia, found that his horſes left untouched, among other plants, the following: Meadow-ſweet, great wild valerian, lily of the valley, angelica, roſe-bay willow, marſh cinquefoil, mountain and globe crowfoot, crane's-bill, yellow wolfsbane, and ſeveral ſhrubs. Soon after his return, he and ſome of his pupils ſet about a courſe of experiments; and above two thouſand were made on horned cattle, ſheep, horſes, hogs, and goats, with the ſole view of determining what kinds of vegetables thoſe animals would eat or reject.——As theſe experiments were made on the indigenous plants of Sweden, they can only be deciſive here with reſpect to plants common to both countries; but as they take in the greater part of Engliſh plants, they would greatly facilitate ſuch an attempt in this kingdom.

[*By Dr.* ANDERSON.]

Cattle and ſheep are known to crop the tops of fir-trees when they can get acceſs to them while young; and thus many plantations of young trees, when not ſufficiently fenced, have been entirely deſtroyed; but whether that kind of food was wholeſome or pernicious to the cattle, has not in general been enquired into.

A letter from the bailiff of a gentleman of conſiderable eminence in ——ſhire, dated the 25th of October 1782, runs thus:—" I was ſo pinched laſt ſpring for provender to " cattle, that I had not a ſtone of ſtraw or hay from the " middle of March; nothing but whins and oats for horſes, " and fir-tops (that is tender ſhoots of firs) for cattle; and " I had 430 horned cattle, and about 120 horſes ſmall and " great, of which I loſt but few (four or five, I cannot tell " which) cattle, but there were numbers of cattle that died " in this country for want. Some tenants loſt one-half of " their cattle, and ſome almoſt the whole."

A neighbouring gentleman alſo, foreſeeing that he ſhould be ſcarce of provender, turned out all his ſtock of two-years-old cattle into a young fir wood near his houſe, in the beginning of winter, and allowed them to pick up what little graſs they could there find, till he ſaw it was all conſumed. He then ſent a man into the wood every morning to cut down from the trees as many branches as would ſubſiſt them for that day. They ate not only the leaves and ſmalleſt twigs, but they even ſometimes gnawed down the ſtumps till they came to be nearly the bigneſs of the thumb. In this way they continued all winter in perfect health.

Dr. Anderſon, in another letter, recommends furze or whins as a food for horſes and cattle, to be bruiſed by a heavy ſtone moved as in a mill. He ſowed it in a field with barley at the rate of from fifteen to thirty pounds of ſeed to an acre. I know (ſays the Doctor) few plants that deſerve the attention of the farmer more than the whin: horſes are peculiarly fond of it. Some perſons think they may be made to perform hard work upon it, without any feeding of grain; but I think it tends more to fatten a horſe than to fit him for hard labour, and that therefore ſome grain ſhould be given with it where the work is ſevere. Cattle eat it perfectly well when thoroughly bruiſed, and grow fat upon it as upon turnips; but unleſs it be very well bruiſed for them they will not eat it freely, and the farmer will be diſappointed in his expectations. Cows that are fed upon it yield nearly as much milk as while upon graſs, which is free from any bad taſte; and the beſt winter-made butter I ever ſaw was obtained from the milk of a cow that was fed upon whins.

By Mr. J. HARVEY PIERCE.]

I hired a ſtout girl at 2s. a week, to cut the green tops of ſome old furze, growing on a hill about a quarter of a mile from the houſe, and bring them in bundles on a pole to a ſpare ſtable, which I prepared for the purpoſe of cutting and threſhing the furze; here it was cut from an inch to two inches long, with a cleaver like what the butchers uſe, and afterwards the ſpines broken with a flail. My threſhing-floor was a temporary one, of ſix or ſeven oak boards, pinned down to four joiſts, laid on the pavement. A buſhel baſket of the furze thus prepared, was allotted to each horſe every morning inſtead of corn; but, I believe, three horſes had generally only two baſkets; not becauſe it was conſidered as ſufficient, but owing to the tediouſneſs of cutting and threſhing, and ſometimes from hindrance of bringing in by bad weather; perhaps too, from not being uſed to the work, and now and then a little idleneſs, when not looked after. I ought, therefore, ſtrictly ſpeaking, to ſay, that with two buſhels three horſes worked in every reſpect as uſual, though without any corn. This food, with hay, was continued till the middle of May 1796, when the horſes were put to graſs.

Lord Cathcart, in a letter to the Agricultural Society in Scotland, ſays, " The ſowing of whins for feeding of cattle, takes mightily about London now. The thin dry ſoil, that is good for nothing elſe, they manage in the ſame way as for ſown graſs; but in place of that, they ſow it in the ſpring with whin ſeed. They mow the whins that ſummer, and continue to do ſo yearly thereafter; and reckon one acre produces at the rate of ten loads, 20 cwt. each; this they ſtack up. They have a contrivance for chopping them, and cut at once as much as ſerves their cattle for two days."

Directions by Major Henbury, for ſowing Whin Seed, and using the Whins.

They ſhould be ſowed in February, March, or April; 6lb. will ſow an acre. The place where they are ſowed muſt be made very free of graſs, and all ſorts of cattle muſt be kept out. One acre will produce fifteen tons, which will feed as far as fifteen tons of hay. The time to begin to cut them is in October or ſooner; they will continue to grow till Chriſtmas, and be fit for uſe till March. When you give them to the horſes, they muſt be bruiſed by a mill, or otherwiſe be pounded, and given in a day after they are bruiſed; if you give any chopped ſtraw with them it will do very well—a hundred of ſtraw will ſerve for a ton of furze. The furze muſt be cut, *only what is the growth one year*, beginning in or before October. The Major has fed ſixteen horſes with them from October to March.

POTATOES.

[*By the Rev. Mr.* HIGSON, *Batheaston.*]

POTATOES flouriſh moſt in a dry ſandy loam. The ground ſhould be manured with rotten dung; and the ſeed changed every year. They ſhould be planted in freſh ground every year. If either freſh or the ſame ſeed be planted upon the ſame ſoil for two or three years ſucceſſively, the crops will generally fail, the haulm come up curled and blighted, and the roots will be worm eaten and cankered.—Potatoes ſhould not be planted deeper than four inches or four inches and a half, and the ſeed or ſets ſhould lie one inch or one inch and a half above the dung. Whole potatoes ſhould be planted at the diſtance of two feet and a half or three feet ſquare; cuts at the diſtance of 18 inches ſquare.

At a quarterly meeting of the Norfolk Society for the encouragement of Agriculture, Jan. 1776, a premium of three guineas was adjudged to Mr. J. Wright, of Great-Melton, for planting and gathering the beſt crop of potatoes, the quantity of land one rood, and the produce 91 buſhels.

It is almoſt unneceſſary to obſerve to the intelligent farmer, that as good a crop of wheat may be expected after well-cultivated potatoes, as in any other mode of huſbandry.

Calculation for cultivating one acre of land with potatoes, according to Mr. Wright's expences, and valuation of this crop:—

	£.	s.	d.
One deep ploughing	0	4	0
Seed 32 buſhels, at 1s. per buſhel	1	12	0
Manure 24 loads, at 2s. per load	2	8	0
Expence of ſetting, the weather being ſo dry that the ſets were put in with an iron crow	1	0	0
Hoeing and earthing up ſeveral times	1	0	0
Expence of taking up	5	8	0
Rent and other charges	1	10	0
	£. 13	2	0
Produce 364 buſhels, at 1s. per buſhel	18	4	0
Clear profit	£. 5	2	0

[*By Mr.* PAVIER, *Monckton.*]

Potatoes grow beſt in a ſoil that is looſe and deep, where the ſwelling of the roots meet the leaſt obſtruction, and where they draw the greateſt nouriſhment moſt eaſily. On this account, where the quantity intended to be raiſed is ſmall, digging is preferable to ploughing. But if the land be ploughed deep, and well pulverized, ſucceſs need not be doubted. They ought to be planted in lines, eighteen inches apart, and at twelve or fourteen inches diſtance in each line or row. This will give opportunity for earthing them up with the horſe-hoe while young, which will greatly promote their fertility. If the horſe-hoe is not intended to be uſed, plant them a foot ſquare, and earth them up with hand-hoes ſeveral times, which, although more expenſive, will repay the coſt.——*March* 1779.

[*By* J. A.; *Feb.* 1783.]

My field of potatoes was four acres and a half, the ſoil very poor, being light, looſe, and ſandy. In January, I carried on ten waggon-loads of dung per acre; and the month following folded it over with my ſheep, and then ploughed it as deep as the ground would bear, and harrowed it ſmooth. In March I planted my potatoes, eighteen buſhels per acre; I had them cut in two, three, or four pieces, according to their ſize, and let them in with iron bars, in ranks two feet aſunder, and one foot diſtance in the ranks. They were of the large white kind, with large eyes, but I know not the name. Soon after they were up I had them hand-hoed, and a little while after horſe-hoed them. The horſe-hoe I uſed was ſo conſtructed as to earth them up at the ſame time, and performed the work ſo well, that I think it contributed greatly to the ſucceſs of the crop. Nothing more was done till the latter end of October, when I began taking them up. The produce was 480 buſhels per acre, or 160 ſacks. Any perſon bringing ſacks, and taking them on the ſpot, had them for four ſhillings per ſack. Expences of ſeed, planting, cutting, hoeing, and taking up, were as follow:

	£.	s.	d.
Eighteen buſhels planted per acre, at 2s.	1	16	0
Cutting the ſaid eighteen buſhels ——	0	6	0
Hand-hoeing 4s. horſe-hoeing 2s. per acre	0	6	0
Planting per acre — —	0	8	0
Expence of taking up per acre ——	2	8	0
Total	£.5	4	0

N. B. The expence of pitting and carrying home not included.

Produce 160 ſacks per acre, at 4s. a ſack 32 0 0

In the month of June 1782, a gentleman near Bath planted three acres and half of land with potatoes of the long kidney-ſhaped white kind from Ireland. The ſoil was a lightiſh loam, and being virgin earth, no manure of any kind was uſed. The produce, when taken up in October, was 380 ſacks of four buſhels each ſack, or nearly 440 buſhels per acre. T. B.

[*By Mr.* HAZARD, *Stony-Littleton.*]

Firſt, the earth ſhould be dug twelve inches deep, if the ſoil will allow of it; after this, a hole ſhould be opened about ſix inches deep, and horſe-dung or long litter ſhould be put therein about three inches thick. This hole ſhould not be more than twelve inches in diameter; upon this dung or litter a potatoe ſhould be planted whole, upon which a little more dung ſhould be ſhaken, and then earth muſt be put thereon. In like manner the whole plot of ground muſt be planted, taking care that each potatoe be at leaſt ſixteen inches apart; and when the young ſhoots make their appearance, they ſhould have freſh mould drawn round them with a hoe; and if the tender ſhoots are covered, it will prevent the froſt from injuring them. They ſhould again be earthed when the ſhoots make a ſecond appearance, but not be covered, as in all probability the ſeaſon will then be leſs ſevere. I obtained the laſt year from a ſingle root thus planted very near forty pounds weight of large potatoes, and from almoſt every other root upon the ſame plot of ground, from fifteen to twenty pounds weight.

The ſecond method will ſuit the indolent, or thoſe who have not time to dig their ground; and that is, where weeds much abound and have not been cleared in the winter, a trench may be opened in a ſtrait line the whole length of the ground, and about ſix inches deep; in this trench the potatoes ſhould be planted about ten inches apart; cuttings or ſmall potatoes will do for this method. When they are laid in the trench, the weeds that are on the ſurface may be pared off on each ſide about ten inches from it, and be turned upon the plants; another trench ſhould then be dug, and the mould that comes out of it turned carefully on the weeds. It muſt not be forgot, that each trench ſhould be regularly dug, that the potatoes may be throughout the plot ten or twelve inches from each other.——This ſlovenly method will in general raiſe more potatoes than can be produced by digging the ground twice, and dibbling in the plants; and the reaſon is, that the weeds lighten the ſoil, and give the roots room to expand. They ſhould be twice hoed, and earthed up in rows; and here note, that if cut potatoes are to be planted, every cutting ſhould have two eyes, for though fewer ſets will be obtained, there will be a greater certainty of a crop, as one eye often fails, or is deſtroyed by grubs in the earth.

A good crop may be obtained by laying potatoes upon turf at about twelve or fourteen inches apart, and upon beds of about ſix feet wide, on each ſide of which a trench ſhould be opened about three feet wide, and the turf that comes from thence ſhould be laid with the graſſy ſide downwards upon the potatoes. A ſpit of mould ſhould next be taken from the trenches, and be ſpread over the turf, and in like manner the whole plot of ground that is deſigned to be planted muſt be treated. And remark, that when the young ſhoots appear, another ſpit of mould from the trenches ſhould be ſtrewed over the beds, ſo as to cover the ſhoots; this will prevent the froſt from injuring them, encourage them to expand, and totally deſtroy the young weeds; and when the potatoes are taken up in the autumn, a careful perſon may turn the earth again into the trenches, ſo as to make the ſurface level; and from the ſame ground a better crop of potatoes may be obtained the following year.

For field planting, a good (if not the beſt) method is to dung the land, which ſhould be once ploughed previous thereto; and when it is ploughed a ſecond time, a careful perſon ſhould drop the potatoe-plants before the plough in every third furrow at about eight or ten inches apart.

I ſhall conclude by noting, that gravelly, ſtony, chalky, or ſtiff clay land, will never produce many potatoes; and the few they do produce, will be cankered, and only fit for pigs; it is therefore obvious, ſuch ſoils are improper.—*Feb.* 1786.

[*By Sir* THOMAS BEEVOR.]

The white Champain (of which you ſaw about two acres) produced me at the rate of 346 buſhels per acre. Another kind, procured me by a friend from Mancheſter, (of which I had ſufficient to plant ſix rods or perches of land) produced at the rate of 648 buſhels per acre; and the ſort given me by our ingenious friend Mr. Rigby, who received them from Liverpool, and which had been only two or three years before raiſed *from ſeed*, were planted on one and the ninth part of a rod or perch of land; and produced at the rate of 1080 buſhels per acre. The Champain were fit for uſe ſooner than the other two kinds, by about ſix weeks; but were neither ſo large, nor numerous upon the roots. All theſe kinds were dry, mealy, and well-flavoured, ſcarcely differing from each other in taſte. They were all cultivated by the plough, in the ſame field, in the ſame manner, and at the ſame time. The difference of the produce is prodigious, owing, I conceive, in ſome meaſure, to their having been longer, or more lately raiſed from the ſeed. This obſervation has, I know, been made by others; but be it as it may, I will propagate the laſt ſort upon as large a ſcale as my ſtock of them will permit; and if I find them continue as productive as in the laſt year, I will be ſure to communicate the ſtock to you, if you wiſh to have it. I have chiefly applied them to the feeding of hogs. When boiled, and given to fattening ſwine, I have not found them anſwer alone; but mixed with an equal part of barley or buck-meal, I have had them equally fat, and in as ſhort a time, as thoſe which were fed with either of the meals alone. Given raw, they are admirable for ſtore ſwine, cows, or bullocks.—*Jan.* 1786.

[*By the same.*]

All the underwritten potatoes were planted on the 2d day of April, in a garden, the ſoil of which is a rich hazelly coloured loam, neither too wet nor too dry; they were all well dunged, for the four firſt ſorts ſtood on a border where a row of apple-trees had grown, which were taken up about a month only before the ſets were planted; the three laſt ſorts were planted on ground which had been cropped as gardens uſually are, and the pieces planted were cut from arge potatoes, with two or three eyes on each piece.

No.	*Names.*	*Weight of ſeed.*		*Quantity of Ground.*	*Weight of Produce.*		*Buſhels per Acre.*
		lb.	oz.		ſt.	oz.	
1.	Incomparable, a ſeedling,	4	9	6-10ths of a rod	13	0	602
2.	Denne's Hill, dit	3	1	8-10ths	16	10	668
3.	Bayley's ſeedling,	3	1	5-10ths	8	6	539
4.	Manley White,	4	12	3-10ths	6	4	670
5.	Kentiſh ſeedling,	2	10	4-10ths	16	11	1342
6.	Champion,	3	6	5-10ths	11	1	708
7.	Ox-Noble,	3	11	4-10ths	14	0	1140

The above roots were all taken up on the 29th day of October laſt, and the ſtems of each (except thoſe of the Manly and Champion, which were entirely dead) were green and freſh at the time of taking them up.

No. 1. Large, white, meally, ill-taſted.
No. 2. Very large, white, meally, and good.
No. 3. Middle-ſized, white, meally, and well-flavoured.
No. 4. Large, white, meally, and good-taſted.
No. 5. Very large, white, not yet tried upon the table.
No. 6. Middle-ſized, white, meally, and good to eat.
No. 7. Large, white, and ill-flavoured.

The buſhels above-mentioned are heaped, weighing on an average 70lb. each.——*Dec.* 1787.

[*By the Rev. Mr.* Close.]

The potatoe ſets ſhould be cut a week before planting, with one or two eyes to each, and the pieces not very ſmall; two buſhels of freſh-ſlaked lime ſhould be ſown over the ſurface of the land as ſoon as planted, which will effectually prevent the attacks of the grub.——In fattening cattle, I allow them all they will eat: a beaſt of about thirty-five ſtone will require a buſhel per day, but will fatten one-third ſooner than on turnips. The potatoes ſhould be clean waſhed, and not given until they are dry. They do not require boiling for any purpoſe but fattening hogs for bacon, or poultry; the latter eat them greedily. I prefer the champion potatoe to any ſort I ever cultivated. They do not anſwer ſo well for horſes and colts as I expected, though ſome gentlemen have approved of them as ſubſtitutes for oats.——*Nov.* 1785.

[*By the Bishop of Killaloe.*]

Spread your manure in lines (of about five or ſix feet broad) upon the ground, about twelve or fourteen waggon-loads to an acre, leaving an interval of about two feet and a half between every row of manure. The intervals to be broader or narrower, according to the depth of ſoil on the land; where the vegetable mould is ſhalloweſt, the intervals to be broadeſt. Then cut your potatoes into pieces, leaving one eye (from whence a ſmall fibre of the root ſeems to grow), upon every piece; every one of theſe eyes will produce a new plant. Spread the pieces on the ground, at a foot or a foot and a half diſtance. Then ſend in your diggers, and let them dig out of the intervals as much earth as will cover the pieces of potatoes about two inches. As ſoon as the new plants all appear above ground, ſend in the diggers again, and cover the plants completely. When they appear above ground a ſecond time, cover them again with earth dug out of the intervals, taking care not to go much deeper than the remaining vegetable mould; though you may venture to go a little into the thill or clay, as it will tend rather to improve the land than otherwiſe; for, lying at the top, it will not injure the vegetation; and being expoſed to the ſun and dews, it will be converted into fertile earth, in a ſeaſon or two, as well as the reſt.

[*By* W. BRAINES.]

The ſoil on which the beſt crops of potatoes are raiſed, is a ſtrongiſh loam; the manure uſed is rotten dung, which is laid on juſt before planting, in the proportion of from 15 to 20 loads per acre. 24 buſhels, cut into ſets of one or two good eyes each, are planted per acre, at fifteen inches diſtance, and kept clean by hoeing, in which the earth is drawn up round the plants as they advance in height. The produce on an average, ten tons per acre—126lbs. to the hundred.

They take them up with a broad three-tined fork, at three guineas per acre. The average expence per acre, is about 10l.——The *Ayleſbury White* is moſtly planted for the table, but the *Ox-noble* is moſt productive for cattle.

[*By Mr.* WIMPEY.]

In Dec. 1787, two ſtatute acres were ploughed up, and lay rough through the winter. The February following, the ground was well dragged, forty cart loads of long dung were then equally ſpread upon the ſame, and immediately ploughed in. The beginning of April, furrows were drawn the length-way of the field with a double-breaſted plough, at about two feet eight inches diſtance one from the other, in which the potatoe ſets were dropped by hand, at the diſtance of from 12 to 14 or 15 inches, which were covered by ſplitting the ridges with the ſame double-breaſted plough, throwing one half of the mould to the right hand, the other half to the left, and by that means forming a ridge over each rank of ſets, and leaving a deep furrow in each interval. In this ſituation they continued till the ſets had ſhot 5 or 6 inches.

By that time the weeds began to appear in great abundance. A ſmall common one-wheel plough was then ſet to work, as near each ſide of each rank of potatoes as could be without damage to the plants. This operation raiſed high ridges in the intervals between the rows.

In this ſtate it continued till the weeds began to advance again in their growth. The double-breaſted plough was then ſet to work again, going up the middle of one row, and down another, by which operation each ſide of the plants were completely earthed up; and before freſh weeds could vegetate, the luxuriance of the greens was ſuch as to completely cover the intervals; ſo that the whole ſurface of the field had one uniform appearance.

In this ſituation they continued till about the 20th of October, when the greens being moſtly decayed, and the weather very fine, they were begun to be taken up in the following manner: A ſtrong plough was ſet deep enough to work below the bed of the roots, with which the ploughman goes up one row and down another, turning the roots up to the ſurface. Women, boys, and girls, follow the plough, and pick them up in baſkets as faſt as they are turned out. A pair of drags with long tines are drawn over the ground after it has been picked, by which many are brought up to the ſurface, which had eſcaped the pickers. When the whole field has been gone over in this manner, we may then give it a clean ploughing and harrowing, by which means very few roots eſcape. Thus the whole operation is completely gone through, and the land left in the moſt perfect condition for the immediate reception of a crop of wheat.

An exact account of the produce, expence, and nett profit of two ſtatute acres planted with potatoes in the manner aforeſaid. Produce 750 buſhels; tithe paid in kind deducted, ſay 75 buſhels, leaves 675; which, at 1s. per buſhel, or 3s. per ſack, amounts to £.33 15 0

EXPENCES.

A clean ploughing in winter - - - - -	0	12	0	
Dragging in February - - - - - - -	0	3	0	
Forty loads of long dung and carriage -	4	0	0	
Spurling ditto - - - - - - - - - - -	0	2	0	
Ploughing in the dung - - - - - - -	0	12	0	
Striking furrows with double-plough - -	0	6	0	
Planting and cutting potatoes - - - -	0	6	0	
Covering them with double-plough - -	0	6	0	
Sets 15 ſacks at 3s. - - - - - - - -	2	5	0	
Ploughing intervals from the rows - -	0	6	0	
Earthing up the plants - - - - - - -	0	6	0	
Taking them up, ploughing up, drawing home, ſtacking, &c. three horſes, man, and boy, five days - - - - - - -	1	10	0	
One man, one woman, 5 days - - - - -	0	7	6	
Boys and girls - - - - - - - - - - -	0	5	9	
A year's rent - - - - - - - - - - -	2	0	0	13 7 3
Nett profit on 2 acres - - - - - - -				£20 7 9

or 10l. 3s. 10½d. per acre.

But to do juſtice to the experiment, the ſucceeding crop of wheat ſhould be charged with at leaſt 4l. and that ſum added to the nett profit would amount then to 12l. 3s. 10½d. per acre, for it would have coſt ſo much at leaſt to have brought the barley ſtubble into ſo perfect a tilth and fertile condition as the potatoes left it in.

For ſome three or four years paſt, I have alſo made ſome trials of raiſing potatoes from ſeed. The firſt year I had ſome bulbs as large as a pullet's egg, but I did not then remark any variety of ſorts. The largeſt of theſe were preſerved, and planted the following April. The October following they were carefully dug up, and were as large in general as thoſe produced from old bulbs; many of them from half a pound to a pound and upwards. Among theſe there were not leſs than five or ſix different ſpecies, moſt of them totally different, not only from the parent ſtocks, from which the ſeeds were obtained, but alſo from every other ſpecies I had ever ſeen, or have to this hour. They were of different colours, figures, and texture. Some a ſmooth yellowiſh white, ſome a duſky brown, ſome a reddiſh brown, ſome had a rough ſkin, ſome ſmooth, ſome diſtinct ſingle bulbs of a regular ſhape, others a congeries of bulbs from 6 to 10 or 12, connected together by a kind of neck, compoſing a maſs, ſometimes nearly as big as half a peck meaſure. But there was one ſpecies which far exceeded all the reſt in beauty; many of them were as big as a gooſe's egg, a fine clear ſmooth ſkin of a yellowiſh white, finely pounced with ſmall crimſon ſpots, the complexion beautiful, and the ſubſtance as good as I ever taſted.

Doctor Anderſon ſeems to doubt if the ſexual ſyſtem of Linnæus takes place in the propagation of new varieties in this uſeful plant; but it ſeems very certain from the above account, that varieties of them are attainable from ſeed, and that moſt probably by the bloſſoms of ſome plants being impregnated with the male duſt of others, ſimilar to what happens to the whole tribe of cabbages, carrots, parſnips, beets, &c.

That the pea tribe continue invariably the ſame, though they ſhould be reared in the moſt promiſcuous manner, the Doctor ſeems fully convinced, and I have nothing to offer againſt it; but he ſays alſo, "all the kinds of beans poſſeſs the ſame property." With all due ſubmiſſion to the Doctor's ſuperior judgment, I muſt think in this he is certainly miſtaken. In 1787, I planted a field chiefly with garden beans of moſt of the ſorts known; they were planted in rows about a yard aſunder, in the following order: Mazagan, White-bloſſom, Long-podded, Sandwich, Toker, and laſtly Windſor. The Mazagan and White-bloſſom were threſhed firſt, when to my great ſurprize I found I had quite a new ſpecies, or rather ſeveral. The Mazagan, inſtead of being of their natural colour, were mottled black and white; the White-bloſſom, inſtead of their natural jetty ſhining black, were brown, black, and yellow, blended together, and both much larger than uſual. The Long-podded were alſo very much of the ſame colour. Here then is an undeniable proof that beans, of ſome ſorts at leaſt, are as ſubject to ſeminal variations as any claſs of plants whatſoever. I aſſert this with great confidence, as the experiment was not made on a ſmall trifling ſcale, for I had eight or ten ſacks of theſe beans which I had agreed with a ſeedſman for at 5s. a buſhel. When they were threſhed, I wrote him word what happened, and diſpoſed of them among my hogs and horſes.—1788.

On a trial which was the moſt advantageous mode of planting potatoes, whether whole or cuttings, 325 poles of ground were planted, and the whole produce 378 buſhels. The meaſure of the ground planted with *cut* potatoes was 265 pole, the produce 312 buſhels. The ground planted with whole or *uncut* ſets was ſixty pole, and the produce of the ſame ſixty-ſix buſhels.

The acreable produce being nearly the ſame, whether planted with whole or cut potatoes, the great and intereſting comparative queſtion remains, viz. What is the difference of the expence in the planting of cut or uncut potatoes?—which is very ſatisfactorily aſcertained as follows:—If 48 buſhels, the whole quantity of ſets uſed, produced 378 buſhels, then 34 buſhels, the quantity cut, ſhould produce 267 buſhels; but they produced 312, which is 45 buſhels more than the proportion. Again, if 48 buſhels produced 378 buſhels, then 14 buſhels ſhould have produced 110 buſhels; but 14 buſhels of uncut produced only 66 buſhels, which is 44 buſhels leſs than the proportion. A preference of 40 per cent. in favour of cut potatoes in compariſon with whole ſets!—*North-Bockhampton*, 1789.

[*By the Rev. Mr.* CLOSE]

The reſult of all my experiments tends to prove, that bullocks will fat ſooner on potatoes, than on either cabbages or turnips:—190 ſheep out of 200, I fed upon them in one year, fatted beyond my expectation; ten never, I believe, were induced to touch them, but were ſupported upon a ſmall quantity of hay during the winter months. I was not able to aſſign any cauſe for the averſion thoſe ten took to roots on which the other 190 feed greedily, and throve ſurpringly.——*October* 1789.

[*By Dr.* ANDERSON.]

It ſtill remains a doubt with practical farmers, whether it is moſt profitable to uſe ſmall potatoes *uncut* for ſeed, or large ones *cut into pieces.*

EXPERIMENT FIRST.

April 26th, 1776, four rows of potatoes were planted in a piece of garden ground, without dung: 1ſt row, ſmall potatoes planted whole; 2d, potatoes ſomewhat larger than the former, cut into two equal parts; 3d, pieces cut from the ſmall end of large potatoes, with one eye in each; 4th, pieces cut from the large end of the ſame potatoe, with one eye in each.——Theſe potatoes were properly hoed, and kept free from weeds during the ſummer, and on the 30th of October they were dug up, and, after being properly cleaned, the weight of the produce of the reſpective rows was found to be as under, in avoirdupoiſe weight:—

	lb.	oz.		lb.	oz.
1ſt row - - -	18	0	3d row - - -	12	5¼
2d ditto - - -	16	13	4th ditto - - -	36	4

EXPERIMENT SECOND.

On the 5th of May, 20 plants of each of the following kinds were provided and planted, each kind by itſelf in a ſingle row; all the plants in each row nearly of one ſize. A row of potatoes cut promiſcuouſly having been firſt planted next the edge of the plot for the ſake of accuracy:

	Ounces.
1ſt row. Small potatoes whole. The twenty plants together weighed - - - - - - - - - -	5½
2d. Small Potatoes cut in two - - - - - -	3¾
3d. Small pieces cut from the ſmall end of large potatoes, with one eye in each - - - - - -	1½
4th. Pieces of an equal ſize with the former, cut out of the large end of large potatoes, with one eye in each - - - - - - - - - - - - -	1½
5th. Large pieces cut from the great end of the ſame potatoes that were employed in Nos. 3 and 4, having only one eye in each - - - - -	26¼
6th. Large potatoes, from which all the eyes had been cut out, ſave one about the middle part of the bulb - - - - - - - - - - - - -	121½

	Ounces.
7th. Large potatoes with one eye only, left in the the ſmall end of the bulb - - - - - - -	123½
8th. Large potatoes planted whole, as nearly as could be got, of an equal ſize with the former -	124½

EXPERIMENT THIRD.

On the ſame patch of ground that was prepared for the foregoing experiment, and immediately contiguous to the 8th row in the preceding experiment, (one row only intervening, which will be afterwards taken notice of) was planted on the ſame day with them, *ſeven* other rows of ſeeds, being each of them exactly of the ſame ſize and weight with the foregoing; ſo that it was an exact repetition of the ſame experiment, intended to ſave time. The only difference between them was, that the ſeventh row was here entirely omitted for want of room. The general reſult of theſe two experiments was as under; the uppermoſt row of figures, where double, denoting the reſult of experiment 2d, and the undermoſt of experiment 3d.

No. of rows.	No. of ſeeds that germinated.	Weight of ſeed. lb.	oz.	No. of roots produced.	Average.		Weight of the produce of each row. lb.	oz.	Average weight of the produce. lb.	oz.	
1ſt,	19 20		5½	122 125	123½		6 8	0 12	7	6	
2d,	16 10		3¾	107 131	119		5 6	13 0	5	15½	
3d,	17 [illegible]		1½	62 54	58	64½	2 1	8 15	2	3¼	2 6½
4th,	17 17		1½	56 86	71		2 3	3½ 0	2	9¾	
5th,	20 19		26	190 192	191				12	2¼	
6th,	20 10	7	11½	315 258	286½		19 16	3 15½	18	1¼	
7th,	20	7	11½	374	374		18	10½	18	10½	
8th,	20 20	7	12½	470 330	400		21 20	5½ 3½	20	12½	

It may, in the firſt place, be inferred, by a careful review of theſe two experiments, *that the produce is not materially affected by planting for ſeed, either whole potatoes or cuttings,* *or large or ſmall potatoes merely as ſuch; for that it is only incidentally that either of theſe particulars can affect the crop.* The whole potatoes in the firſt row yielded a ſmaller produce than the *cuttings* in the 6th row. Seed from *ſmall* potatoes yielded a ſmaller produce than was obtained from *large* ones, in the 5th, 6th, 7th, and 8th rows; but it yielded a greater produce than was obtained from *the ſame* large potatoes, in the 3d and 4th rows. It ſeems, in the *ſecond* place, to be a fact confirmed by every ſtep in both theſe experiments, *that the weight of the crop is always in ſome meaſure influenced by the* WEIGHT *of the ſeeds planted.* The 3d and 4th rows, in which the ſeeds were *lighteſt*, yielded the pooreſt crop; and a progreſſion from lighter to more weighty is obſervable in the *produce* as well as the ſeeds through the 1ſt, 2d, 5th, 6th, 7th, and 8th rows. Some trivial variations do not diſturb the general rule, which ſeems to be ſufficiently eſtabliſhed by the general reſult of the firſt ſix rows.

EXPERIMENT FOURTH.

With a view to know of what conſequence it was in the practice of agriculture, to employ plump or lean grain for ſeed, I planted, April 2d, 1770, upon a ſmall bed of ground in a garden, one hundred of the plumpeſt grains of oats that I could pick out from a large parcel of *unmixed* oats, in five rows, five inches row from row, and one inch between each plant in the rows. On another equal ſpot in the ſame ground, I planted at the ſame time, and in the ſame manner, one hundred of the hungrieſt grains I could pick out from the ſame parcel of oats: but to inſure againſt contingencies, I alſo took as many of the ſmall hungry grains as equalled *in weight* the hundred plump grains above-mentioned, which, when numbered, I found amounted to one hundred and ſeventy. Theſe 170 grains I planted in five rows, each of the ſame length as the former, and diſtant from each other five inches, ſo that the hundred and ſeventy bad grains occupied preciſely as much ground as the hundred good grains.

Result.—No. 1ſt. That diviſion on which a hundred good grains were ſown, produced ninety-five plants.——2d. That on which a hundred lean grains were ſown yielded 96.——3d. That diviſion on which were ſown the one hundred and ſeventy hungry grains, yielded alſo ninety ſix.

On the firſt appearance of the ſeed leaves above ground, thoſe of No. 1ſt were broader and more ſucculent than thoſe of the other two plots; but long before harveſt it was not poſſible to remark any difference in either of the three diviſions. The grain when ripe was equally healthy in No. 3d as in No. 1ſt, and the crop ſeemingly as weighty in every reſpect: but this I could not aſcertain with the certainty I wiſhed, on account of the deſtruction by birds, &c.

To enable individuals to eſtimate without much trouble the amount of any crop of potatoes they wiſh to examine, I here ſubjoin a table, ſhewing the number of plants that would be contained in an acre at ſeveral diſtances, and the weight of produce from twenty plants in each caſe, when the whole produce of an acre would be twenty-five, fifty, ſeventy five. One, two, three, four, five, ſix, ſeven, eight, nine, ten, eleven, or twelve hundred buſhels of 56lbs. each —beginning with ſix inches and ending with thirty ſix inches diſtance from plant to plant: *That is to ſay*,

When the plants ſtand at ſix inches from each other every way, an acre contains 174,240 plants.——If the crop is equal to 100 buſhels per acre, the produce of twenty ſtems would be 0.631 pounds and decimals:—If the crop was equal to 500 buſhels per acre, the produce of 20 plants would be 3,15 pounds and decimals:—And if 1000 buſhels per acre, the produce of 20 plants would be 6.31 pounds, as in the firſt line of the table.—And after the ſame manner all the others are to be read in the following table:

Diſtance of plants from each other.	aoumnted to 1,100 Buſhels. lb. dec.	1,200 Buſhels. lb. dec.
6	6.94	7.56
7	9.61	10.48
8	12.56	13.70
9	15.90	17.34
10	18.63	21.42
11	23.76	25.92
12	28.28	30.84
13	33.18	36.20
14	38.59	42.10
15	42.23	48.24
16	50.28	54.84
17	56.80	61.96
18	63.60	69.38
19	71.10	77.34
20	78.43	85.56
21	86.61	94.48
22	95.07	103.70
23	104.73	114.24
24	113.12	123.46
25	122.74	133.90
26	132.77	144.84
27	143.18	156.20
28	154.00	168.00
29	165.18	180.20
30	176.77	192.84
31	188.73	205.88
32	191.13	219.42
33	213.88	233.32
34	226.84	247.46
35	239.97	261.78
36	257.03	280.40

By nents, or in any
other ty ſhould be ſe-
lected ple—Suppoſe a
hundre ppoſe at 12 in-
ches di 1 × 5=18.155
and ſo on might be got
by ſub come as low as
20 buſ table I find the
neareſt s per acre which
being f being 625 per
acre.

T

[*By Sir* THOMAS BEEVOR.]

April 30*th*, 1789, *I planted Sixty Golden Lunn Potatoes, weighing together* 13 *lb.* 8 *oz. in five rows. The rows two feet asunder, soil strong and rich, but not dunged.*

No.	Square Feet of Land.	No. of Potatoes.	Weight		Diſtance between the Sets	Weight of Product.			Meaſure, ditto				Weight per Acre.				Meaſure per Acre.			
			Lb.	*Oz.*		*St.*	*Lb.*	*Oz.*	*B.*	*P.*	*G.*	*Qts.*	*Ton.*	*Cwt.*	*St.*	*Lb.*	*B.*	*P.*	*G.*	*Qts.*
1	60	15 planted whole	3	6	2 feet	9	10	0	1	3	0	2 $\frac{1}{37}$	44	1	4	8	1356	2	1	1
2	45	15 ditto	3	6	1½ ditto	4	3	0	0	3	0	1$\frac{1}{6}$	25	9	7	6	765	1	0	0
3	60	7½ cut into 15 ſets	1	11	2 ditto	3	5	0	0	2	1$\frac{1}{75}$		15	4	5	4	363	3	1	0
4	45	7½ ditto	1	11	1½ ditto	2	10	0	0	2	0$\frac{}{75}$		16	8	3	6	487	1	0	0
5	92	15 cut into 46 ſets	3	6	1 ditto	10	1	14	1	3	1	0 1 pt.	29	19	6	2	887	1	2	0
	302	60	13	8		30	1	14	5	1	0	3 1								

A Root of No. 1. produced 86 potatoes, varying from the ſize of a hen's to that of a ſwan's egg. The weight of which was 1ſt. 5lb.—In the calculation of the weight, very ſmall fractions are omitted.

⁂ Nos. 1, 2, 5, were outſide; 3, 4, inſide rows.——A buſhel weighs 75 lb.

[*By Sir* MORDAUNT MARTIN.]

No other inſtruments than the common ploughs and harrows of the country are required for preparing cleaning, earthing up, and taking up the crop, except once hoeing between the ſtalks in the rows; but the dryneſs and ſhallow ſtaple of the ſoil here is ſo ill-ſuited to the growth of potatoes, (eſpecially in dry ſeaſons) that I have reluctantly abandoned the purſuit, in the courſe of which I wiſhed to invent ſomething to raiſe the potatoes as generally as poſſible to the ſurface in ploughing them up.—*Burnham*, *Norfolk*, *Mar.* 1793.

[*By* J. H. PIERCE, eſq; *of Axminster.*]

The potatoe ſets (with two eyes each) are cut about a fortnight before planting. As I never had one curled, I think the cutting ſo long before prevents the evil. A few days before I plant, the dung is ſpread over the ground, then with a double-board plough a furrow is made, and the ſets put in about ten inches aſunder by children; women and men follow with an implement made with a piece of board 3 qrs. of an inch thick, 4 inches deep, and 15 long; a handle is fixed to the board in the ſame manner as to a common hay-rake; with this implement the dung is puſhed into the furrow, on the ſets; ſo that all the dung for about 22 inches parallel with the furrow is applied. The plough then goes back and covers the dung; afterwards two other furrows are made; thus planting at every third furrow.—1795.

[*By* R HILL, eſq; *Plymouth, near Cardiff.*]

I have, for two years laſt paſt, cultivated the potatoe from the ſprouts or ſhoots, both in my garden and fields; though in no very extenſive degree. The laſt year in my garden I ſet forty ſhoots, and earthed them up at various times with freſh earth; on taking them up in November, I had a produce from them of upwards of two Wincheſter buſhels; and about the third of an acre in the open field, managed in the ſame manner, produced as well as cuttings.—1795.

[*By Mr.* BARTLEY; *Briſtol*, 1795.]

I have long ſince made up my mind as to this fact, that a ſack of potatoes of 224lbs. containing one-fourth part of farinaceous matter, is at leaſt equal in value, as an article of food in the family of a poor cottager, to a buſhel of the beſt wheat; and the unanimous concurrence of this deſcription of people will bear me out.

I have made excellent bread with a mixture of one-third boiled potatoes and two-thirds wheat flour.—But if ever potatoes ſhould be introduced as an article in bread, on a general ſcale, I doubt not the proper mode would be, in the firſt inſtance, to extract the flour or farinaceous matter by means of ſome ſuitable apparatus, that might eaſily be invented.

[*By the Rev.* J. BARTON; *April*, 1795.]

In May laſt a plantation of raſpberries which had been made in potatoe ground the preceding autumn, was choaked up with potatoe ſtalks, from the negligence of the labourers in clearing and preparing the ground. A thought ſtruck me, that they might be made beneficial plants inſtead of being thrown away as weeds, which had hitherto been the caſe whenever they grew in forbidden ground. I therefore dug them up carefully, and planted about a hundred of them as I would cabbages in drills, where ſome manure had been previouſly laid; and pulled off the potatoes that adhered to the roots of the ſtalks. On digging them up laſt autumn every ſtalk produced from ten to fifteen potatoes, none very ſmall, and ſome of an uncommon large ſize. I weighed the produce of a dozen ſtalks, and found that they amounted to 27 pounds; but theſe I took as they lay contiguous to each other in the drill; had I weighed the produce of picked ſtalks I am ſatisfied the weight would have been near 40lbs.

Now, ſir, the benefits that will ariſe from this experiment, if the mode be generally practiſed, I take to be the following: Whenever potatoes ſhall be left in the ground, the ſtalks that grow from them will reward the induſtry of the farmer, in clearing the ground of them; and the potatoes (adhering to the roots) may be given to the pigs. The man of fortune will give theſe ſtalks to his cottagers, or to poor people, to plant in their little gardens, which muſt be a relief to them when potatoes happen to be ſcarce in the ſpring.

[*By the Rev. Mr.* Whittle.]

In the year 1790, I planted a large ſquare of potatoes, one-third of which was *with the rind*, one-third with *whole potatoes*, and the other part with *pieces*, cut in the uſual way; and I aſſure you, when the ſeaſon came for digging, there was not the leaſt viſible difference in the produce.

The following year, I planted in the ſame row or drill, one whole potatoe, one piece, and one piece of rind, in which there was an eye, alternately; and when the ſeaſon came for digging, I was very careful in my obſervation, but unable to perceive any difference in the crop.

[*By the Rev.* A. Campbell, *Kilcalmonel.*]

EXPERIMENTS ON POTATOES.

Rows.	In 1790.	Inches diſtant in the Rows		Value per Acre of the produce, after the Seed is deducted. £.	s.	d.
1.	Small whole potatoes …………	6	—	16	6	$7\frac{7}{8}$
2.	Large pieces …………………	3	—	15	16	6
3.	Large pieces …………………	6	—	15	8	6
4.	Large pieces …………………	12	—	13	4	$1\frac{7}{8}$

In 1791.

1.	Large whole	6	—	18	18	$1\frac{1}{2}$
2.	Small whole	3	—	18	1	$4\frac{1}{8}$
3.	Small whole	6	—	17	11	$9\frac{3}{4}$
4.	Small whole	12	—	17	3	6
5.	Small pieces	6	—	16	1	$5\frac{1}{8}$

In 1792.

1.	Small whole	6	—	19	7	$1\frac{7}{8}$
2.	Large whole	6	—	18	18	$1\frac{1}{2}$
3.	Large whole	12	—	18	9	$9\frac{1}{2}$
4.	Large pieces	6	—	18	3	0
5.	Small whole	12	—	18	1	$5\frac{1}{4}$
6.	Large pieces	12	—	16	19	6

In 1794. Table 2.

1.	Middle-ſized whole	12	—	32	8	$0\frac{3}{12}$
4.	Small pieces	12	—	29	19	$2\frac{3}{12}$
6.	Small whole	12	—	29	2	$4\frac{1}{12}$
5.	Small pieces	6	—	28	17	$6\frac{11}{12}$
7.	Small whole	6	—	26	19	$3\frac{7}{12}$
3.	Middle-ſized whole	6	—	25	7	$5\frac{1}{12}$
2.	Middle-ſized, confined to one eye and ſtem	12	—	23	12	$1\frac{11}{12}$

Without dung in 1795, after dunged potatoes.

7.	Middle-ſized whole	6	—	28	11	$7\frac{7}{12}$
2.	Large pieces	12	—	26	1	$10\frac{5}{12}$
4.	Small whole	12	—	24	2	$11\frac{8}{12}$
5.	Middle-ſized whole	12	—	24	2	$11\frac{8}{12}$
6.	Middle-ſized whole	9	—	23	19	$5\frac{1}{12}$
3.	Large whole	12	—	23	10	$8\frac{10}{12}$
1.	Shoots	12	—	15	11	$9\frac{6}{12}$

The real produce from 50 yards of row, planted with ſhoots, was only two pecks 5-19ths, but only 63 of 150 came up; if none had failed, the produce would have been no more than what is ſtated in the table.

[This calculation, then, it is ſuppoſed, goes on the ſuppoſition that the 150 ſhoots had borne in the proportion in which the ſixty-three did.]

TABLE I. 1794.

Rows.	Value per Acre of the groſs produce.		
	£.	s.	d.
1. Undunged potatoes, after dunged turnips ...	25	19	$8\frac{3}{12}$
2. Undunged, after dunged fallow	27	10	$2\frac{6}{12}$
3. Undunged, ſubſtituted for a ſummer fallow	14	10	$4\frac{8}{12}$
4. Purple-hearted, dibbled in the top of a well-dunged row	48	10	$6\frac{4}{12}$
5. White-kidney, planted in the ſame manner	27	2	$5\frac{4}{12}$
6. White-kidney, upon much dung in the row	29	0	$9\frac{6}{12}$
7. White-kidney upon little dung	24	16	$8\frac{10}{12}$
8. White flat potatoes, upon little dung	30	19	0

The foregoing tables are an abſtract of the reſult of experiments, made by Alexander Campbell, miniſter of Kilcalmonell, in Argyleſhire, on different methods of planting potatoes, in the years 1790, 1791, 1792, 1794, and 1795, with a view to diſcover whether it is more beneficial to plant them large or ſmall, whole or in pieces, and to aſcertain the diſtance at which they ſhould be ſet in the row.

Similar experiments were made in 1793; but ſome inequality in the ſoil, which was not obſerved in due time, rendered them not ſufficiently accurate for the purpoſe in view.

There is a ſeparate ſet of experiments made in 1794, and the purpoſe of which will be obſerved by inſpecting Table 1, for that year, and attending to the obſervations which refer to it.—Each of the experiment rows in 1790, was 75 yards in length; in 1791 and 1792, 200 yards; in 1794 and 1795, 50 yards. The numbers prefixed to the rows in 1794, table 2, and in 1795, point out the order, or juxta poſition, in which they were planted.

Extract from EXPERIMENT *on* POTATOES *in* 1794.

TABLE II.

Rows.		Inches diſtant in the row.		By Experiment per 50 yards of row.			By calculation per Engliſh acre.			Value per acre, at 6d. the Lenlithgow peck.		
				Bolls.	Pecks.	Lbs.	Bolls.	Pecks.	Lbs.	£.	s.	d.
1.	Middle-ſized whole -	12	Produce - - -		12	8	90	2	15	36	1	$4\frac{9}{12}$
			Seed - - - -		1	5	9	2	13	3	13	$4\frac{1}{12}$
			Clear produce -		11	3	81	0	2	32	8	0^{8}
2.	Middle-ſized, confined to eye and ſtem - -	12	Produce - - -		10	0	72	9	11	28	0	$9\frac{6}{12}$
			Seed - - - -		1	10	11	1	5	4	8	$7\frac{7}{12}$
			Clear produce -		8	9	61	8	6	23	12	$1\frac{11}{12}$

Above is a ſpecimen of the manner in which the experiment tables were originally conſtructed.

If the preceding abſtracts are not reckoned ſufficient, the full tables can be ſent.

Theſe potatoes were planted in rows upon dung, except where it is otherwiſe mentioned, and then covered up with a double earth-board. In 1790, 1791, and 1792, the rows were three feet, and in 1794 and 1795, two feet and a half aſunder. This, with the difference of ſeaſons, will account for the greater produce in the laſt two years. The diſtances at which the potatoes were planted in the rows, were meaſured by a ſtick with notches, and taken from the centre of the potatoe-ſets. Care was taken to have the rows as equal in quality of ſoil as poſſible, and to have equal juſtice done them, in manuring, where manure was applied, and in horſe-hoeing them. The quantity planted and raiſed was carefully marked in the field by the author of the experiment, and no part of the proceſs of management was entruſted to any other perſon.

Obſervation.—It is of great conſequence to the farmer to pay attention to the kind of potatoe uſed for planting: ſee the amazing difference between No. 4 and No. 5, Table I. Though the moſt productive kind ſhould not be the beſt taſted, it ought however to be planted for the uſe of horſes, cows, hogs, and poultry. The potatoe in No. 8, is the beſt eating potatoe of thoſe mentioned in the experiments; yet the produce from it, with little dung, exceeded that from No. 6 with much dung.

[*By* DAVID SWEET, *esq; Gittisham, Devon.*]

As the following experiments, which induced me to trouble you with this letter, will ſpeak for themſelves, I ſhall only beg leave to obſerve, that my labourers are ſo ſenſible of the value of a ſmall potatoe, that what before they gave to their poultry, or threw away, they now preſerve; which will be a ſaving to them of many ſhillings.

EXPERIMENT I.

Planted in the field, May 12th, 1795, one-third of an acre with ſmall potatoes, about twelve to the pound—the produce 40 bags, of 160lb. to the bag.—40 X 160 X 3= 19,200lb. per acre.

EXPERIMENT II.

Planted in the Garden the 3d of June.

No.		Produce. Potatoes.	Weight. lb.
No. 1.	—3 whole potatoes, 1lb. each, having 76 eyes, planted four feet apart, and three wide — — —	117	28½
2.	—4 whole ditto, ½lb. each, 32 eyes, planted three feet each way —	106	28
3.	—12 whole ditto, together 1lb. planted 2 feet apart, in drills 15 inches aſunder — — — —	*Theſe two moſtly deſtroyed by the pigs getting into the garden; but about 18 lb. left uninjured; weighing half a pound each.*	
4.	—12 ditto of 1 lb. cut in half, a foot apart, in drills two feet aſunder		
5.	—71 cuttings of large potatoes, 1 eye each, one foot apart, the drill 16 inches aſunder — — —	122	36
6.	—71 cuttings ditto, with two eyes in each, planted as No. 5 — —	174	39

EXPERIMENT III.

Planted the 27th of April, 1796.

No.		Produced	
No. 1.	—3 lb. of potatoes, 24 to the pound, put in whole — — —	110	
2.	—3lb. ditto, 24 to the lb. cut in half	126	
3.	—1lb. ditto, 60 to the pound, put in whole — — — —	60	3 plants deficient.
4.	—1lb. ditto, 60 to the pound, cut in half — — — — —	96	8 plants deficient.
5.	—1000 potatoes, 42 to the pound, (making near 24lb) put in whole	664	

Each potatoe, and half potatoe, planted 6 inches apart, in drills 20 inches aſunder, and twice hoed.

EXPERIMENT IV.

In a ſmall bed.

	Produce.	Weight.
	Potatoes.	℔.
No. 1.—3 whole potatoes, 42 to the pound, 6 eyes in each — — —	75	8¼
2.—6 half ditto, 3 eyes in each —	56	12
3.—12 quarter ditto, 1 and 2 eyes in each	131	23

Each potatoe, half and quarter, planted in a ſquare of 18 inches; theſe potatoes a ſmall early ſort.

EXPERIMENT V.

Planted on the 24th and 25th of June 1796, in a bed in which were early ſpring cabbage, about 28lb. weight of potatoes, whole and in cuttings; they were taken up the 11th of November, remarkably fine.

[*By the Rev. Mr.* LAMPORT.]

Let the farmer, or gardener, gather the apples of his potatoes in October, and hang them up in a warm room till Chriſtmas; then waſh out the ſeeds, ſpread and dry them on paper, and preſerve them from damps till the ſpring. In March ſow them in rows one foot aſunder, in ground well prepared; and when the plants are three inches high, gently earth them up. About three weeks after tranſplant them in land well dunged and made fine, and dig them up in autumn.——By this means you may have great varieties, and your crop next year will be large both in ſize and quantity.——*Dec.* 1777.

[*By* J. Billingsley, *esq.*]

Expences of the Culture, and the Produce, of six acres of Potatoes, on land value 20s. per acre.

	£.	s.	d.
1782. Nov. 3 Ploughing the oat-ſtubble, after black-oats, at 4s.	1	4	0
1783 March 7. Another ploughing at 4s.	1	4	0
——— 25, Harrowing at 2s.	0	12	0
Thirty cart-loads of dung per acre, 3s. per load, halling included	27	0	0
April 27. Began planting, and finiſhed the 25th of May, in beds 8 feet wide, and the alley 2½ feet; placed the ſets at 1 foot diſtance on the fallow, then ſpread the dung on them, after which they were covered 3 or 4 inches with the earth from the alleys, at 26s. per acre	7	16	0
Seed from Dumfries, in Scotland, (very high price) 5 ſacks to an acre, at 14s. per ſack	21	0	0
June 15. Hoeing at 6s.	1	16	0
Aug 3. Hand-weeding at 4s.	1	4	0
Oct. 18. Digging up at 40s. per acre	12	0	0
Halling, pitting, thatching, &c.	4	0	0
Tithe	1	10	0
Rent	6	0	0
Sundries, &c.	0	6	0
	85	12	

PRODUCE. [*Sacks of* 240*lb. wt.*]

	£.	s.	d.
Beſt 550 ſacks, ſay at 4s.	110	0	0
Middling 100, at 3s. 6d. per ſack	17	10	0
Small 50, at 2s. 6d.	6	5	0
	133	15	0
Expences	85	12	0
Profit	48	3	0

Which is upwards of 8l. profit per acre, and the land left in excellent order for wheat.

EXPENCES.

	£.	s.	d.
Ploughing an oat ſtubble, in October 1783, at 4s. per acre	1	4	0
Croſs-ploughing in March 1784	1	4	0
Harrowing at 2s. per acre	0	12	0
180 cart-loads of compoſt manure, 3l. per acre	18	0	0
42 ſacks of ſeed potatoes (each ſack weighing 240lb.) of the white ſort	10	10	0
Cutting the ſets 6d. the ſack	1	1	0
Setting on ridges 8 feet wide (leaving an interval of 2 feet for an alley) 6d. for every 20 yards	10	12	0
Hoeing at 5s. per acre	1	10	0
Digging up the two-feet interval, and throwing the earth on the plants, at 10s. per acre	3	0	0
Digging up the crop at 8d. for every 20 yards in length, the breadth being 8 feet	14	6	0
Labour and expence of ſecuring in pits, wear and tear of baſkets, ſtraw, reed, ſpikes, &c. 10s. per acre	3	0	0
Rent 6l.—Tithe 30s.	7	10	0
	£72	9	0

PRODUCE.

600 ſacks of beſt potatoes, at 4s. per ſack	120	0	0
120 ſacks of middle-ſized, 3s. 6d.	21	0	0
50 of ſmall, 2s.	5	0	0
N. B. Each ſack 240lb.	£146	0	0
Expences	72	9	0
Profit	£73	11	0

the autumn of 1783. In October it was ploughed, and left in a rough ſtate during the winter. In April, it was croſs-ploughed and harrowed.—On the 8th of May I began

It may be proper to remark, that the field on which the above experiment was made, was an oat-ſtubble in planting, by marking out the field into beds or ridges eight feet wide, leaving a ſpace of two feet wide for an alley between every two ridges. The manure (a compoſt of ſtable dung, virgin earth, and ſcrapings of a turnpike-road) was then brought on the land, and depoſited in ſmall heaps on the centre of each ridge, in the proportion of about thirty cart-loads to each acre. A trench was then opened with a ſpade, breadth-way of the ridge, about four inches deep; in this trench the potatoe ſets were placed, at the diſtance of nine inches from each other; the dung was then ſpread in a trench on the ſets, and a ſpace or plit of fourteen inches in breadth, dug in upon them.

When the plants were above ſix inches high, they were carefully hoed, and ſoon after the two-feet intervals between the ridges were dug, and the contents thrown around the young plants. This refreſhment, added to the ample manuring previouſly beſtowed, produced ſuch a luxuriance and rapidity of growth, that no weed could ſhew its head. I need not add, that the land is now in a ſtate of the higheſt fertility, perfectly clean, and in moſt excellent preparation either for wheat or ſpring corn.

It may be alſo remarked, that in this mode of planting, a very ſmall ſpace of ground is left unoccupied, and the crop more abundant than any I ever before experienced. If this experiment be thought worthy of imitation, and the culture of this excellent root be thereby in any degree extended, it will afford great ſatisfaction to the Society's well-wiſher.

[*By* JOHN BILLINGSLEY, *esq.*]

The turnip huſbandry has been conſidered as the *ne plus ultra* of good farming; and that moſt uſeful animal, the ſheep, is almoſt ſolely dependant upon *that* root for winter provender. Is it not therefore worth while to draw a fair comparative eſtimate of the expences and produce of a turnip and potatoe crop.

EXPENCES.

TURNIPS.	per acre.			POTATOES.	per acre.		
	£.	s.	d.		£.	s.	d.
5 ploughings -	0	15	0	2 ploughings -	0	6	0
4 harrowings -	0	4	0	1 harrowing -	0	1	0
Seed - - -	0	0	9	Planting -	1	1	0
Sowing - -	0	0	3	Seed - - -	2	0	0
2 hoeings -	0	7	6	Hoeing - -	0	7	6
				Digging up, &c.	2	0	0
	1	7	6		5	15	0

PRODUCE.

If a very good crop -	3	0	0	If a very good crop, 100 ſacks, at 2s. 6d. a ſack	12	10	0

Even on the moſt ſuperficial view, the ſuperiority of potatoes is apparent; but when you take into conſideration the certainty of one crop, and the uncertainty of the other, a farmer muſt be an infidel indeed who will not acknowledge it.

Turnips are liable to many accidents. In their infant ſtate, the *fly*, or, perhaps more properly ſpeaking, the *ſlug*, demoliſhes them. If they eſcape this enemy, and get into rough leaf, the black canker attacks them, and leaves in a few days a whole field anatomized. Should they ſurvive all maladies, and come to ever ſo great perfection, a ſevere froſt or deep ſnow debars you from making the moſt of them; and after all, it frequently happens, that in the months of February and March, a ſevere froſt following a wet day, deſtroys your whole crop, and deprives you of every reſource, ſave the hay-mow.

Not ſo *potatoes:*—when pitted and well ſecured, they are ſafe from all riſque, (the pilfering hand excepted) and are as good in the months of March and April as in October.

Potatoes ſhould not be viewed merely in the light of profit, but as the means of cleanſing the land, and preparing it moſt excellently for a corn crop. There is a great difference between an expenſive fallow, and a profitable fallow crop: the farmer, therefore, ſhould be contented, if they pay the expences of an ample manuring, and keep the land clean.

It may be expected that I ſhould ſay ſomething of the *curl* diſeaſe, to which this root is in ſome degree liable; but I muſt confeſs, that notwithſtanding all my attention for twenty years paſt, during which time I have been in the conſtant habit of planting on a large ſcale, I cannot ſpeak *deciſively* on this ſubject. It ſeems involved in impenetrable myſtery. I have planted from the ſame pit of potatoes on the ſame day, in the ſame ſoil, prepared with the ſame manure; part of the crop has come curled, part not; nay, I have known two ſhoots from the *ſame* ſet, the one curled, the other not. I have raiſed from ſeed, and been careful to gather the ſeed from the fineſt and moſt flouriſhing plants; they have been in every reſpect as ſubject to the diſorder as the cuttings of old ſeed. Leſt the *heat* of the pits might be injurious, I have covered them in the place where they grew, and left them *undug* till the time of planting;—all the ſame! I have planted before they ſhoot out, and after;—no difference! I once planted two tons of potatoes in the month of June, which were more than half rotten, and purchaſed at a trifling ſum of a captain of a Dumfries ſhip, on Briſtol quay, and I never had a much better crop.——What certain concluſions, then, can be drawn from theſe premiſes —but that, with all our wiſdom, we are perfectly ignorant of ſome of the moſt ſimple operations of nature?

I have been in the habit of planting *whole* potatoes, *large* cuttings, *ſmall* cuttings—nay, the mere eye of the potatoe only; but I never could ſee any difference in reſpect to the *curl*. If the potatoe was *diſpoſed* to be curled, it proved almoſt equally ſo in all methods; and on the other hand, I never knew a true Dumfries potatoe come curled the *firſt* year; perhaps the *ſecond* year a few would be curled; but beware of the *third*; for be aſſured, let your ſoil or manure be ever ſo good, almoſt all will be *curled* the third year, if planted in the *ſame* ſoil or neighbourhood.

As to the land moſt favourable to this root, there can be little doubt:—A rich ſandy loam is the beſt, but potatoes may be grown to advantage on all ſoils of a *looſe* texture. The richer the land, the more abundant the crop, which varies from 50 to 150 ſacks (240 lb.) per acre; but let not the farmer confide too much in the ſtrength of his ſoil, to the excluſion of manure; not leſs than twenty cart-loads of which (30 buſhels each) ſhould be put on an acre. Of all manures, horſe-dung, *well rotted* is the beſt; next to it, hog's dung; after that all other ſorts of animal dung. Lime, marle, chalk, ſoaper's aſhes, and rags, do but little good; and in ſome inſtances do harm, by making the potatoes ſcabby. Green vetches, or clover, covered in by planting, is good manure.

Endeavour, as much as you can, to plant in dry weather, either in the months of April or May. Uſe large ſets; that is, pick out the largeſt and fineſt potatoes for ſeed, and ſlice them in two pieces, from the crown to the root. Change your ſeed every two years, and go as far from home as you can for a ſupply. In the vicinity of Briſtol, perhaps the Scotch ſeed, imported from Dumfries, is the beſt. Do not cover your ſets in planting with more than three inches depth of earth, and be particularly attentive to the rooks, which, by their ſagacity of ſmell, will find them out, and would make great depredation. After the plants have been up about three weeks, ſet your hoers to work.

If labourers can be got, prefer *digging* to ploughing up; and when you dig, compel your men to thruſt their ſpade under the potatoes, and not dig in perpendicularly; by this means they avoid cutting the roots. Never dig up in wet weather; and as faſt as dug, ſecure them in the following manner:—Make a trench in a dry part of the field, eight inches deep and four feet wide; ſpread a thin layer of dry ſtraw on the bottom, and againſt the ſides; then throw in your potatoes, and raiſe them to the height of four feet, leaving the top ſhelving in the form of a roof: on the potatoes thus placed, lay a bed of dry ſtraw ſix or eight inches thick, and cover the ſame with mould, dug from the ſides of the pit, and patted on to the thickneſs of a foot; after this, let your thatcher cover it with ſtraw, or the haulm of the potatoe, ſufficient to keep out the rain. In this way, I have kept many thouſand ſacks through the moſt ſevere winters, without injury.

EXPERIMENT NO. I. SEVEN ACRES.

Culture, expences, and produce, of a field of ſeven acres, ſoil a gravelly loam, on a bed of limeſtone rock, value about 8s. per acre. This field was, in 1783, part of the foreſt of Mendip, and was in its *unincloſed* ſtate worth about 3s. 6d. per acre.——*Expences* 70l. 7s. 2d. *Produce* 500 ſacks; prime coſt about 2s. 10d. a ſack.

NO. II. EIGHT ACRES.

Soil a gravelly loam worth 20s. per acre, had been laid down with ſainfoin three years before, which did not ſucceed. This field was marked out into beds, eight feet wide, leaving four-feet interval to cover with. Farm-yard dung, twenty cart-loads to an acre, was then ſpread equally on the beds, and the ſets placed thereon at the diſtance of one foot. The interval or alley was then dug to cover the ſets, turning the graſs downwards, or turf to turf. This is called by ſome the lazy-bed method.——*Expences* 85l. 12s. 6d. *Produce* 564 ſacks; prime coſt 3s. per ſack.

NO. III. TWELVE ACRES.

Same ſoil as the foregoing; was in oats 1784; the ſtubble ploughed immediately after harveſt. In March 1785 it was croſs-ploughed, and well harrowed; lines were then drawn longitudinally, with a double-breaſted plough, at the diſtance of four feet, and in this furrow farm-yard dung was ſtrewed, after the rate of twelve loads per acre; on this the ſets were put, at the diſtance of nine inches, and then covered with a light plough. Part of this field was planted with my own ſeed, and part with Scotch ſeed, then imported; the latter the beſt crop by nearly one-third.——*Expences* 95l. 16s. 6d. *Produce* 651 ſacks; prime coſt 3s. 1d. a ſack.

NO. IV. TWELVE ACRES.

Expences 105l. 15s. *Produce* 968 ſacks; prime coſt 2s. 2d. per ſack.

NO. V. FIFTY ACRES.

Soil, woodcock loam, 18s. per acre; these were two fields of a four-years old ley, and moſſy; they were ploughed in November, croſs-ploughed in March, then harrowed and planted in May, in beds five feet wide, alleys three feet.——*Expences* 527l. 0s. *Produce* 3850 ſacks, prime coſt 2s. 9d. per ſack.

Statement of the whole of Sixteen Experiments.

No. of Exper.			EXPENCES.						PRODUCE.						
	Acres.		*Per Acre.*			*Total.*			*Sacks.*						
			£.	s.	d.	£.	s.	d.			s.	d.	£.	s.	d.
1784.															
1	7	ſallowed	10	1	0	70	7	2	505	at	2	10	71	10	0
1785.															
2	8	ley	10	14	0	85	12	6	564	—	3	0	84	12	0
3	12	fallow	8	0	0	95	16	0	621	—	3	1	95	14	0
4	12	ditto	8	16	0	105	15	0	968	—	2	2	104	17	0
1786.															
5	50	ditto	10	11	0	527	8	0	3850	—	2	9	528	17	0
1787.															
6	8	ditto	9	4	0	73	14	0	564	—	2	8	75	0	0
7	2	foreſt	12	10	0	25	0	4	220	—	2	3	24	15	0
8	50	ley	10	2	0	505	5	0	3680	—	2	9	506	0	0
1788.															
9	7	fallow	15	10	0	108	10	6	1110	—	2	0	111	0	0
10	80	ditto	9	2	0	727	0	0	4700	—	3	1	724	0	0
11	10	vetches	8	0	0	79	15	0	940	—	1	8	78	6	0
12	20	burnt	5	12	0	112	0	0	800	—	2	9	110	0	0
1789.															
13	6	fallow	7	6	0	43	16	0	245	—	3	9	45	18	9
14	15	ley	10	0	0	150	14	3	1250	—	2	5	151	16	0
1790.															
15	6	fallow	11	0	0	66	9	0	542	—	2	6	67	15	0
16	8	rough	7	16	0	62	6	7	365	—	3	6	63	17	6
	301	acres.				2839	9	4	20924	ſacks			2843	18	3

Average expences per acre 9l. 9s. 3d.

Average produce per acre about 70 ſacks.

Average value per acre, prime coſt about 2s. 9d. per ſack of 240 lb.

EXPERIMENTS ON FEEDING HOGS.

[It may be neceſſary to premiſe, that though in the ſubſequent accounts the expences and conſumption of the hogs are in ſums total; yet the account was taken regularly every month, and it is now brought into groſs ſums, merely to ſhorten the account.]

EXPENCES.

	£.	s.	d.
1785, *January* 5.			
To 12 hogs bought at 25s. each. -	15	0	0
April 13.			
Attendance, boiling food, ſerving, &c. 14 weeks	1	15	0
To carriage of pot to boiling-houſe -	0	17	6
To coal, 24 buſhels, at 6d. per buſhel -	0	12	0
To 115 ſacks potatoes, prime coſt 2s. 10d. per ſack	16	5	10
To 7½ quarters of barley and oatmeal, 22s. 6d. per quarter - - -	8	8	6
To ſtraw, 3½ waggon-loads, 10s. per load	1	15	0
To killing - - - -	0	4	0
To hauling to Bath - -	0	12	0
	£.45	9	10

PRODUCE.

1786, *April.*			
12 hogs ſold to Symes, 146½ ſcore, 7s. per ſcore,	51	5	6
By 30 cart-loads of dung, 2s. in place -	3	0	0
	54	5	6
Expences	45	9	10
Profit	£.8	15	8

Encouraged, however, by this experiment, I was induced to enter on a larger ſcale into this mode of applying the potatoe crop. I accordingly built a boiling-houſe and ſties; put up a caſt-iron furnace, capable of holding two hogſheads;

a pump; bought ſome old oil-caſks, at 10s. each, to hold the waſh; the coſt of all which amounted to about 70l.— As the houſe proved very convenient, I ſhall deſcribe it. It was of one ſtory, about 16 feet ſquare, built with ſtone, and covered with tile. In the room below were the furnace, tubs, &c. and the upper room had a large door, opening to a road-way; through this door the potatoes were thrown into the room out of the waggon. In this upper room was a pump, which conveyed water to a large trough, in which the potatoes were waſhed, and from which they were immediately thrown into the furnace beneath. The foul water was let out through an aperture in the wall, adjoining the trough. The potatoes were waſhed in a wire ſieve. By this ſaving of labour, one man could ſerve 90 or 100 hogs. Adjoining the boiling-houſe were ſties, divided into eight compartments, and capable of lodging 80 or 90 hogs.

After ſeven other experiments, made from the year 1785 to 1791, on ſumming up, the reſult of the whole was,

PROFIT.	£.	s.	d.	LOSS.	£.	s.	d.
1785, Exp. i.	8	15	8	1786, Exp. ii.	18	5	6
1786,——iii.	8	1	8	1788,——v.	156	16	8
1787,——iv.	1	14	6	1789,——vii.	66	1	8
1789,——vi.	142	8	0	1791,——ix.	13	18	0
1790,——viii.	8	9	0				
					255	0	10
	169	8	10				
Balance loſt	85	12	0	By balance loſt	85	12	0
	£.255	0	10	Expences in erecting ſties, boiling-houſes, &c.	100	0	0
					£.185	12	0

At 2s. 9d. per ſack, this loſs is incurred in feeding hogs for ſeven years.

It appears by the accounts that 16,778 ſacks of potatoes have been conſumed by hogs in the ſeven years' experiments, and conſequently (the ſum total raiſed being 20,924 ſacks) that 4146 ſacks have been ſold and planted. Eſtimating theſe therefore, at an average of 4s. per ſack, a profit will remain (after deducting the above loſs, viz. 185l. 12s.) of 73l. 10s. 6d. The reſult therefore is, that potatoes are worth, as a food for hogs, ſomething more than 2s. 6d. per ſack of 240 lb. weight.

Of the CURL in POTATOES.

MANY letters were publiſhed by the Agriculture Society at Mancheſter, in conſequence of a reward being offered for diſcovering the cauſe of the Curled Diſeaſe in Potatoes. In the firſt letter the writer is of opinion, that this diſeaſe is cauſed by an inſect produced by froſt or bad keeping before ſetting; and that the neweſt kinds, ſuch as have been raiſed within theſe nine or ten years, are moſt apt to curl, becauſe they will not ſtand to be kept in winter and ſpring before ſetting, as the old kinds will.—The ſecond attributes the cauſe of this diſeaſe to a white grub or inſect, which he found near the root, about half an inch long, with eight or ten legs, its head brown and hard; as upon examining a number of the curled roots, he found them all bitten, chiefly from the ſurface to the root, which of courſe ſtopped the progreſs of the ſap, and threw the leaf into a curl.—Letter III. aſcribes the cauſe of the diſeaſe to the method of earthing the ſtems while in cultivation; and that the branch, ſtriking root into the new earthed-up ſoil, produces potatoes of ſuch a nature as the year following to cauſe the diſeaſe complained of.—Letter IV. thinks that the diſorder proceeds from potatoes being ſet in old tilled or worn-out ground; for, though thoſe potatoes may look tolerably well, yet their ſets will moſt, if not all, produce curled potatoes.—Letter V. In 1772, this writer planted ſome potatoes by accident full *nine* inches deep; when taken up, many of the plants were rotted, and a few curled. He kept the whole produce for ſeed, and planted two acres with it in 1773, not quite ſix inches deep. The crop was amazingly great, and he did not obſerve any curled plants among them. In 1774, he took ſome potatoes from a crop that was curled the year before, and after cutting the ſets, left them in a dry room for a month. Half were planted in ground dug fourteen days before; the other half, having been ſteeped in a brine made of whitſter's aſhes for two hours, were alſo planted in the ſame land at the ſame time. The ſteeped ones came up ten days before the others, and hardly any miſſed, or were curled. The unſteeped ones generally failed, and thoſe few that came up were moſtly curled. He therefore adviſes as a remedy, 1*ſt*. That the potatoes intended for *next* year's ſets be planted nine inches deep. 2*dly*. That they remain in the ground as long as the ſeaſon will permit. 3*dly*. That the ſets be well defended from froſt till the beginning of March. 4*thly*. That the ſets be cut a fortnight before planting. 5*thly*. That they be ſteeped as above two hours in brine or lye. 6*thly*. That the dung be put *over* the ſets. And, 7*thly*. That freſh ſets be got every year from ſandy ſoils near the coaſt, or on the ſhore.—Letter VI. This writer ſays, he has found by experience, that the red never curl.—Letter VII. Two of the writer's neighbours had their ſets out of one heap of potatoes; they both ſet with the plough, the one early and the other late in the ſeaſon. Moſt of thoſe early ſet proved curled, and moſt of thoſe ſet late, ſmooth; the latter on clay land. He concludes, the only ſure way to prevent the curl is, to let potatoes intended for ſeed ſtand till they are fully ripe, and to keep them dry all the winter.—Letter VIII. The cauſe of the curled diſeaſe this writer attributes to potatoes being of late years produced from *ſeed* inſtead of *roots*, as formerly.—Letter IX. This writer ſays, that all ſorts of grain wear out and turn wild, if ſown too long on the ſame land; the ſame will hold good in all ſorts of pulſe, peaſe, beans, and (as he conceives) potatoes. It generally happens, that thoſe who have moſt curled potatoes plant very ſmall ſets.—Letter X. Set potatoes with the ſprits broke off, and they will (ſays the writer of this letter) be curled ones; if ſet with the ſprits on, they will not be curled.—Letter XI. This writer was at the expence of procuring ſets at fifty miles diſtance, and where this diſeaſe was not known; the firſt year's trial was ſucceſsful; the year following he procured ſets from the ſame place, but one fifth of his crop was infected. By way of experiment, he planted ſets from roots which had been infected the year before, and ſome of theſe produced healthy plants, free from all infection. On a piece of ground that had not been dug for twenty years, he planted four rows of ſets, which he knew to be perfectly clear: the drills were two feet diſtant; the ſets one foot diſtant in each drill. He then planted on the ſame ground four rows with ſets from curled potatoes, at equal diſtances; in each row were about 20 ſets.

Lot 1ſt, the curled ſtate.

No. 1. without manure,
2. in ſalt,
No. 3. in ſoot,
4. in quick lime.

Lot 2d, the clear ſets.

No. 1. without manure,
2. in ſalt,
No. 3. in ſoot,
4. in quick lime.

Thoſe planted in ſalt and ſoot, in both lots, were deſtroyed. In Lot 1, No. 1 and 4 curled. Lot 2, No. 1 and 4 clear. —Letter XII. This writer aſcribes the cauſe of the curled diſeaſe in potatoes to the froſt and bad keeping in winter and ſpring before ſetting.—Letter XIII. This writer thinks that putting off the ſprouts once or more before the ſets are put in the ground, is the cauſe of the curled diſeaſe; and adviſes when the potatoes intended for ſets are dug up, to lay them in a weſt aſpect as dry as poſſible: in ſuch a ſituation they will not ſprout ſo ſoon.—Letter XIV. This writer ſays, that laſt ſpring one of his neighbours cut and ſet, in the uſual way of drilling, ſome loads of the largeſt potatoes he could procure; and more than half of them proved curled. Being a few ſets ſhort of the quantity wanted, he planted ſome very ſmall potatoes, which he had laid by for the pigs. Theſe being fully ripe and ſolid, there was not a curled plant among them.—Letter XV. Although, the writer of this letter obſerves, it is generally believed, that taking up potatoes intended for the next year's ſet too ſoon, is a *principal* cauſe of the curled diſeaſe, he has his doubts reſpecting it. Red potatoes of moſt kinds are ſeldom affected with it.—Letter XVI. This writer believes the richneſs and largeneſs of the ſeed to be the cauſe of the evil; for he does not remember to have ſeen a curled ſtem which did not ſpring from a ſet of a large potatoe.—Letter XVII. This writer apprehends the curled diſeaſe in potatoes to proceed from a defect in the *planta ſeminalis*, or ſeed-plant. One of his neighbours, laſt year, ſet two rows of potatoes, which proving all curled, he did not take them up; and this year there is not a curled one among them. Such potatoes, therefore, as are deſigned for ſeed, ſhould be preſerved as long in the ground as poſſible.—Letter XVIII. This writer adviſes ſuch ſets to be planted as grow in moſs-land; and he ſays, there will not be a ſingle curled one the firſt year.

Although the foregoing letters do not point out with certainty the real or general cauſe of the curled diſeaſe in potatoes, or diſcover any ſpecific remedy, we conceive that the following *general propoſitions* may be fairly drawn from the whole:—*1ſt.* That ſome kinds of potatoes are in the general much more liable to be affected by the diſeaſe than others; and that the Old Red, the Golden Dun, and the Long Dun, are the moſt free from it.—*2dly.* That the diſeaſe is occaſioned by one or more of the following cauſes, either ſingly or combined; 1ſt, by froſt, either before or after the ſets are planted; 2dly, from planting ſets cut out of large unripe potatoes; 3dly, from planting too near the ſurface, and in old worn-out ground; 4thly, from the firſt ſhoots of the ſets being broken off before planting, by which means there is an incapacity in the *planta ſeminalis* to ſend forth others ſufficiently vigorous to expand ſo fully as they ought. *3dly.* That the moſt ſucceſsful methods of preventing the diſeaſe are, cutting the ſets from ſmooth middle-ſized potatoes, that were fully ripe, and had been kept dry after they were taken out of the ground; and without rubbing off their firſt ſhoots, planting them pretty deep in freſh earth, with a mixture of quick-lime, or on limeſtone land.

[ANONYMOUS.]

It ſtruck me, that to ſelect the very prime part of a crop, might be a probable means of preventing that general *diſeaſe* known by the name of the *Curl*, and which is a ſure prognoſtic of a poor dwindling crop. Intelligent farmers are particular, and even curious, in the choice of their ſeed grain; but in reſpect to potatoes choſen for planting, they are moſtly the rubbiſh of the crop.——*Briſtol, Dec.* 1782.

[*By Mr.* SMITH, *Ozleworth, Glocestershire.*]

Inſtead of planting potatoes at ſpring of the year, reverſe the cuſtom, and plant them againſt winter. Plant the roots in rows a pretty good depth, and draw the earth over them with a hoe, ſo as to keep them from the froſt. At the ſpring of the year take down the ridges raiſed by the hoe, and when weeds appear, hoe the intermediate ſpace between the rows; and when the plants appear, draw up the earth round them. Many people put dung in the trenches, when the potatoes are planted in the ſpring; if the ſame method be uſed againſt winter, it will help to preſerve the roots from the froſt.—— It is well known that bulbous-rooted flowers never bloſſom well, if removed at the ſpring of the year. As potatoes are bulbous, the ſame inference may be drawn.

[*By Mr.* PRYCE, *Bath.*]

After much diligent obſervation and enquiry, I had reaſon to believe that the Curl in Potatoes did not ariſe from degenerated or defective ſeed; and as it is certain that the plant is diſeaſed when it firſt appears above the ground, I concluded that the germ or ſhoot muſt receive an accidental injury between the old ſet and the ſurface of the ground. Strongly impreſſed with the truth of this opinion, I dug up ſeveral curled roots, and compared them with healthy ones. The firſt difference that occurred to me was in colour; the lower part of the healthy roots was whitiſh, without ſcar or blemiſh, of a reddiſh purple colour near the ſurface of the ground; the diſeaſed roots, near the ſurface of the ground, were whitiſh, and the lower part had more or leſs the appearance of canker. On a further inſpection, they were found to have been nibbled by ſome inſect. This was not equally apparent in every ſhoot; ſome were found, where the firſt ſhoot was eaten off entirely, about an inch, more or leſs, from the ſet, and from the part which remained a new ſhoot vegetated; others were eaten about half through, and in length from an inch or two to a mere point; and in ſome plants the wound ſeemed quite healed, and the only appearance was that of a ſmall ſcar or ſpot, of the colour of an iron-mould. I have found more curled plants ariſing from the butt, than from the crown end of the potatoe, and from ſmall potatoes than from large ones. The ſhoots which grow with leaſt vigour are longeſt expoſed to accidental injuries, and probably are more mild or palatable to inſects.

[*By Mr.* CHAPPLE, *Bodmin.*]

When the plants are about four or ſix inches high, they are hand-hoed, and if any curled ones appear, they are carefully rooted out, together with the ſets that bear them; when about a foot high, they are again weeded, and the curled plants, if any remain, are carefully rooted out. It is alſo neceſſary to look them over juſt as they are coming into bloſſom, and root them out if any curled appear. I have for twelve years paſt tilled from ſix to ten acres for the market yearly; thoſe intended as ſeed for my general market crops the enſuing year, are tilled at a diſtance from any other potatoe crop, and managed as above-mentioned. Since I have practiſed this mode, which is about ſeven years, the curled diſeaſe hath not injured my crops.——*Nov.* 1794.

[*By Mr.* J. WEBB, *Portsea.*]

About eighteen years ago, I took a large garden near Portſmouth; at that time potatoes were not much uſed in theſe parts, and their culture much leſs underſtood. I believe I planted more than all the other gardeners at that time in this iſland. I ſet of the ſame ſort of potatoes that I found on the premiſes from year to year, for five or ſix years; but to my great loſs and ſurpriſe, I generally loſt half, and ſometimes nearly all my crop, by their being blighted, or infected with what is called the curled diſeaſe. I then changed my ſeed for ſome which grew at or near Torbay; the firſt year they did very well. I planted of the produce of this ſeed the next year, and recommended the ſame to ſome of my friends at Southampton, Wincheſter, Hambledon, and Chicheſter, thinking it was very good; but to our great diſappointment, we loſt the greateſt part of our crops, although at ſo conſiderable a diſtance, and I believe very different ſoils: from whence I infer the fault is not in the land, but in the ſeed.——I was forced hereby to try a different method, and ſoon after Chriſtmas made a hot-bed in the following manner: I laid horſe-dung, &c. about eighteen inches thick, over which I ſpread a layer of fine rich mould about four or five inches thick; upon the top of this mould I laid, in different diviſions, a certain number of potatoes of various ſorts, ſome of my own growth, and others bought from different parts, and covered theſe lightly over with more mould; they ſoon came up. I then obſerved which was freeſt from the blight or curl; for if there were not more than one defective in *forty* or *fifty*, I concluded I might ſet of that ſort with ſafety. This method I have now practiſed near twelve years, and never loſt my crop or any part thereof worth mentioning; whilſt my neighbours, who followed the old method, were frequently diſappointed in their crops: and to the beſt of my knowledge, all thoſe of my neighbours who have of late been perſuaded to take the trouble of uſing the ſame means with myſelf, have never failed of ſucceſs to their utmoſt wiſhes in one inſtance; nor do I ever think it will fail, if duly attended to; the fault being ſome hidden cauſe in the ſeed, unknown at preſent, and I believe incurable by any means.

My reaſon for planting my hot-beds ſo ſoon is, that if the froſt hinders the firſt experiment, or they all prove bad, I may have time to make a ſecond or third, if neceſſary, with different ſorts of ſeed, before the proper ſeaſon arrives for planting in the fields and grounds appointed for the great and general crop.——*Jan.* 1785.

On Diſtilling Potatoes,

[*By Dr.* ANDERSON.]

FEB. 15th, 1777, I ſet apart two Aberdeenſhire pecks of potatoes by meaſure, which I have ſince found were each equal to 36 pounds by weight, ſo that the whole was 72 pounds. Theſe potatoes were boiled in a cauldron till they were brought to a ſoft pulpy ſtate; they were then bruiſed, and made to paſs through a ſtrait riddle with ſome freſh water; the ſkins being kept back by the riddle, which were thrown away. The pulp was then mixed with cold water, till the whole amounted to about twenty gallons Engliſh. This was allowed to cool till it attained the ſame temperature as would be proper for mixing yeaſt with wort; when ſome yeaſt was put to it, as if it had been yeaſt to wort from malt. In ten or twelve hours a fermentation began, which continued very briſkly for twelve hours, but at the end of that time it began ſenſibly to abate; from which circumſtance I was afraid my experiment would fail. After waiting for ſome time, and in vain, warming it a little, to renew the fermentation, I ſtirred it briſkly, to ſee if it could be renewed by that means. This produced the deſired effect, and the ſame operation was renewed every day, and the fermentation continued to go on in a proper manner for a fortnight. At the end of this time the fermentation abated, and could not be renewed by agitation or otherwiſe; and the liquor having acquired a kind of acid ſlightly vinous taſte, was judged fit for diſtillation. It was then diſtilled with due caution, care having been taken to ſtir it in the ſtill until it began to boil, before the head of the ſtill was applied; and the fire was afterwards kept up ſo ſtrong as to keep it boiling briſkly till the whole was run over. This was intended to prevent the thick matter from ſubſiding to the bottom; for I was afraid that without this precaution, it would have acquired a *ſtill-burnt flavour.*— In conſequence of theſe precautions and due rectification, I obtained an Engliſh gallon of a pure ſpirit, conſiderably above proof. This was, in every reſpect, the fineſt and moſt agreeable vinous ſpirit I ever ſaw. In taſte it reſembled fine brandy; but it was more mild than any brandy I ever taſted.

On TURNIPS.

[*By* N. T. *near Ipswich.*]

AS the turnip huſbandry, properly managed, is the foundation of the beſt ſyſtem of Agriculture hitherto diſcovered, I take the liberty of ſending you an account of our method of raiſing that valuable root in Suffolk, which we find very advantageous, both as food for cattle, and as a cleanſing fallow for ſucceeding crops of grain.

In November we plough in our wheat ſtubbles, and give the land four ploughings afterwards, at ſuch times as ſuit our convenience. Previous to the laſt ploughing, which ſhould be in the latter end of June, we cart on twenty loads (as much as three horſes can draw) of rotten dung or muck from the farm-yard, turned up in April, or early in May. One quart of ſeed is ſufficient for an acre. The turnips ſhould be hoed with a ſeven-inch hoe, and left full twelve inches diſtant from plant to plant. We always hoe them twice, and by that means gain near double the weight in produce. Crops vary according to the quality of the land, from forty ſhillings to three pounds per acre in value, and are moſtly fed off in the field. As ſoon as the field is cleared of its ſtock, we plough it up for barley, and give four earths. Sow three buſhels of barley per acre, half above and half under furrow. Fourteen pounds of red clover ſeed is harrowed in with the barley, and the land rolled after the barley is come up.——*Nov.* 1777.

[*By Mr.* WIMPEY.]

In a collection of miſcellaneous papers, written by many different perſons, it is to be expected, that we find not only a variety of opinions, but often ſuch as are incompatible and irreconcileable. To a reader who wiſhes to be informed rather than amuſed, this is an unpleaſant circumſtance, and naturally begets embarraſſment, diffidence, and diſtruſt.

Turnips have been generally conſidered as an article of *precarious* culture; but this is not to be taken in an abſolute ſenſe; for every thing was made perfect in its kind, and there are few things that vegetate more freely or more certainly than the turnip in its proper ſeaſon: but, like all other vegetables, it is more or leſs precarious, as the circumſtances attending its culture are more or leſs favourable.

Nature has ſet and appointed ſeaſons for her ſeveral operations. The ſpring months are the proper time for vegetation and growth of plants; the ſummer months for conſolidating and maturing their growth; and the autumn, for reaping, gathering, and harveſting the ſame. The farmer, however, in the cultivation of turnips, is obliged to depart from thoſe eſtabliſhed laws of nature, to accommodate the crop to his own convenience. The great uſe of turnips, as food for ſheep and cattle, is to ſupply the deficiency of graſs and herbage at a ſeaſon of the year when little of theſe are to be got; and that turnips may be in perfection at a time they become moſt uſeful, the farmer is obliged to poſtpone ſowing them at leaſt three months beyond the time that would be moſt ſeaſonable, that is, moſt favourable to their vegetation. For were turnips to be ſown in March or April, as the ſeaſon might prove moſt favourable, there would be, I conceive, as great a certainty of a crop, as of any other vegetable uſually ſown in thoſe months: but the farmer, for the reaſon before given, being obliged to defer it till the hotteſt ſeaſon of the year comes on, his ſucceſs becomes exceedingly precarious; unleſs he is ſo fortunate as to have a few rainy days, or cloudy weather and frequent ſhowers, ſoon after the ſeed is in the ground. This, I conceive, is the true and only reaſon why the turnip is a more uncertain article than thoſe which are ſown in due ſeaſon. He has from the end of May to the beginning of Auguſt to perform this work, and he had better defer it even to the laſt, rather than ſow when the weather is hot and dry; for in that caſe he may ſow again and again, and loſe both ſeed and labour. But ſhould the weather be ever ſo favourable, that alone will not enſure him ſucceſs: there are ſeveral other things that are equally neceſſary.

1ſt. It is abſolutely neceſſary that the land be very well pulverized. The number of ploughings and harrowings for this purpoſe cannot be aſcertained; that muſt ever depend upon the nature and condition of the ſoil. Twice in ſome land would be more effectual than four times in other; but be the labour whatever it may, it muſt not be omitted.

2dly. It is equally neceſſary that the ſoil be either naturally rich and good, or made ſo by a proper quantity of manure. Turnips never arrive to a good and profitable ſize in poor land, without good manure to promote their growth and puſh them forward.

3dly. It is of great conſequence to have ſeed that is both good in quality and of a good ſpecies. I prefer the large green-topped, as being the ſweeteſt and moſt juicy: ſome prefer the red or purple-topped, as being hardier. But of which ever ſort you ſow, if the ſeed be from the largeſt and fineſt tranſplanted turnips, it is greatly to be preferred, even if it coſt double or treble the price of the common ſort. I have frequently bought of the ſeedſmen in London, but it is generally of a mixed kind, and often a great part not worth cultivating. I would therefore recommend it to the farmer to buy the beſt ſpecies he can get, be the price what it may.

4thly. As to the quantity of ſeed, I am pretty much of opinion with another of your correſpondents, who adviſes to be ſure to allow ſeed *enough*, and to that end thinks the ſafeſt way is to allow two pounds to an acre, though it is common with many to ſow but one. Suppoſing the ſeed to be good, and the ſeaſon favourable, a few ounces would be ſufficient to ſtock the land; but as the article is ſo very precarious, it is by far the ſafeſt way to allow ſeed in plenty, and reduce them afterwards by well harrowing the ground.

Laſtly. The greater your ſucceſs in providing a good plant, the greater will be the neceſſity that the crop be well and carefully hoed; without this, the great advantage to be derived from a good crop of turnips, would in a great meaſure be loſt. Twice hoeing is often ſufficient for this purpoſe, eſpecially if the land be pretty clean; but if it be foul, three times is hardly enough. Hoeing in many places is not well underſtood, although it be an operation of very little difficulty. Practice is neceſſary to give dexterity to every kind of work; but a labourer who has been uſed to work in a garden, and knows the uſe of a hoe, would not only perform it well himſelf with a few hour's inſtruction, but could teach all the labourers in a pariſh in a few days, which would greatly reduce the price of that buſineſs, it having been exorbitant hitherto in many places. The buſineſs, however, might be made eaſy, and much expedited by well hoeing the turnips as ſoon as they arrived at a proper ſtage of their growth; that is, when they have four leaves; and where the turnips are thick, they might be well harrowed a ſecond time, at the diſtance of a fortnight or three weeks. This would not only thin the crop, but alſo greatly improve and encourage the growth of the remainder.

As to the mode of planting, the broad-caſt is the moſt productive, if the hoeing be properly performed, and in good time. However, the mode of ſowing turnips between beans planted in rows, as recommended by ſeveral of your correſpondents, is a much more certain means of inſuring a crop. It correſponds exactly with all my obſervations on the ſucceſsful vegetation of that root.

Whether plants from new or old ſeed are moſt ſecure from the depredations of the fly, is perhaps a queſtion which cannot be eaſily determined, even by experiments; for concomitant circumſtances are frequently ſo much more operative and powerful as to render the difference between them, if there be any, imperceptible. It is, however, in the knowledge of every practical man, that new ſeed ſprouts or vegetates ſeveral days before the old, and I think more vigorouſly; and it is equally well known, that the healthy and vigorous plants eſcape the fly, when the ſtinted and ſickly ſeldom or never eſcape them. It ſhould ſeem then, that new ſeed, *cæteris paribus*, is more ſecure from the fly than old, and for my own uſe I would always prefer it. That old ſeeds are preferred to new in ſome articles by experienced gardeners, is very true, and I believe with good reaſon; but this furniſhes a reaſon againſt giving a preference to old turnip ſeed, contrary to what it is brought for. Old melon and cucumber ſeed is preferred to new, becauſe the plants from old ſeed are far leſs luxuriant and more fruitful.

Many are the *noſtrums* for the prevention or remedying the evils of that deſtructive inſect the fly; but like a charm for the cure of the ague and the tooth-ache, they are found to be equally fabulous and quackiſh. It is certainly very bad reaſoning to conclude, that becauſe certain things are diſagreeable to our ſmell and taſte, they muſt neceſſarily be ſo to creatures of a different kind;—and yet from this ſource their recommendation ſeems to originate. From the great encomiums beſtowed on *Elder*, I was in great hopes a ſpecifick remedy had been found; I therefore determined to give it a fair trial:—accordingly I repeatedly drew elder branches, not only over beds of young turnips, but a variety of other plants; I whipped the ground with them, and ſtrewed the leaves, tops, and tender ſhoots over the beds; and finding all this totally ineffectual, at length I made a very ſtrong decoction in boiling water, and when it was cold, watered the plants with it ſeveral times. All this had juſt as much effect, and no more, as walking round the beds in the ſuperſtitious garb of a magician, and chaunting *Abracadabra* at every turn.——I am quite of opinion that nothing has yet been diſcovered which is at all adequate to the purpoſe, further than it may invigorate and promote the growth of the plants. To this end aſhes, ſoot, or a rich compoſt of lime and dung, if uſed in ſufficient quantities may be deemed ſpecifick; but the beſt means of uſing them is, either to ſow them with the ſeed, or rather by themſelves immediately before, and to well harrow them in, that they may be completely incorporated with the ſoil. This for the moſt part would ſo much encourage the growth of the plants, as to be an overmatch for the moſt vigorous attack of the fly.

If I might be indulged in a wiſh, I would make it a moſt earneſt one, that no writer in future would advance any thing for a fact, which he himſelf hath not had full experience of the truth of. Nothing can be more inimical to the laudable intentions of the Societies eſtabliſhed for the promotion of uſeful knowledge, nor can any thing reflect more diſcredit on their earneſt endeavours to promulgate the ſame for the general information and benefit of mankind, than promiſcuouſly blending fable with truth, and giving chimeras for diſcoveries, which never exiſted but in the imagination of the writer. The *elder* noſtrum above-mentioned has, I believe, diſgraced almoſt every repoſitory of papers on theſe ſubjects, which hath been publiſhed for many years.

To this I would add another wiſh, which is, that no writer in future would communicate any thing to the Society but original papers, without quoting the author from whom ſuch writing was copied or extracted. This would enable the Committee to judge of the propriety of publiſhing the ſame, and often prevent the very uncandid impoſition, which is too frequently practiced, of paſſing extracts for originals, and abſurdly and diſhoneſtly cauſing the ſame thing to be publiſhed many times, much to the diſappointment and loſs of the purchaſer.——*Feb.* 1787.

[*By* E. N. *B*——*d, Norfolk.*]

In cultivating turnips to advantage, great care ſhould be taken to procure good, bright, nimble, and well-dried ſeed, and of the beſt kind. The Norfolk farmers generally raiſe the oval white, the large green-topped, and the red or purple-topped kinds, which from long experience they have found to be the moſt profitable. The roots of the green-topped will grow to a large ſize, and continue good much longer than others. The red or purple-topped will alſo grow large, and continue good to the beginning of February; but the roots become hard and ſtringy ſooner than the former.

Turnip-ſeed, like that of grain, will not do well without frequent changing. Our Norfolk ſeed is ſent to moſt parts of the kingdom; and even to Ireland, but after two years it degenerates; ſo that thoſe who wiſh to have turnips in perfection ſhould procure it freſh every year from Norwich, and they will find their account in ſo doing.

The only riſk in ſowing turnips is the danger of their being eaten by the fly, eſpecially in a dry ſeaſon. This is an evil for which art has not yet found a certain and effectual remedy. Many things have been tried, but none have anſwered in all caſes. The following have, however, often proved of ſervice:—A ſmall quantity of ſoot ſown over the land at their firſt appearance.—Branches of elder with the leaves bruiſed, drawn in a gate over them.—Muſk mixed with the ſeed before it is ſown.—And ſulphur burnt under it, after moiſtening it with water in which tobacco had been ſteeped.—But ſhowers on the plants as ſoon as they appear above ground are the beſt preſervatives.—1781.

[*By Dr.* ANDERSON.]

Among all the varieties of the turnip tribe, the yellow is the moſt remarkable, becauſe its colour is not confined to that part of its ſkin which appears above ground, as in moſt other kinds, but affects not only the whole of the ſkin, but the fleſh alſo. It is by much the ſweeteſt and firmeſt of all the turnip tribe; and inſtead of being injured by the winter's froſt, it is in ſweetneſs of taſte, and tenderneſs of conſiſtence, improved by it. On account of theſe qualities, it is highly valued for the table wherever it is known; but as it never attains to ſuch a ſize as the large green-topt field turnip, and is of a conſiſtence rather too firm for cattle whoſe teeth are tender, it occurred to me that if a mongrel breed could be obtained between theſe two kinds, it would anſwer extremely well for feeding cattle; with this view, I planted ſome yellow turnips of a true kind for ſeed, and cloſe beſide them on both ſides I planted ſome green-topt turnips. In that ſituation they were allowed to flower and to perfect their ſeeds; and as care had been taken to prevent their flower-ſtems from intermixing with each other, the green-topt turnips, were all taken away, and the ſeeds of the yellow kind were beat out by themſelves. Theſe ſeeds were ſown next ſeaſon, and produced a crop of yellow turnips, tinged with a greeniſh caſt above ground; the fleſh of which was neither ſo deep in the colour, nor ſo firm of conſiſtence, as the genuine yellow kind, and the ſize conſiderable larger. It was in every reſpect a *mongrel* breed, which produced its own kind without variation for ten or twelve years that I continued to cultivate it and preſerve it from any intermixture with other ſorts.

[*By* R. P. ANDERDON, *esq*; *Feb.* 1784.]

In ſowing turnips between the rows of beans which have been horſe-hoed, two ounces of ſeed (if good) would be an allowance per acre, if the crop eſcaped its enemies the *worm* and the *fly*; but if *they* invade it, 2 lbs. may be inſufficient.

Permit me here to enumerate many ſtriking advantages ariſing from this mode of cultivation in general, and the horſe-hoeing part of the proceſs in particular.

1*ſt.* That you may have a crop of beans and of turnips on the ſame land the ſame year.——2*dly.* The bean crop being well horſe-hoed, no ploughing is wanted for turnips, for which the beſt Norfolk farmers give five ploughings.--3*dly.* It is hoed cheaper, more effectually, and conſequently more profitable, than in any other way.——4*thly.* The ground is kept clean from weeds.——5*thly.* It is in order for a Lent

crop the ſucceeding year, with one earth.——*6thly.* The ground is kept in heart, if not improved, by fallowing your alleys.——*7thly.* It brings the plant to perfection in poor ground, where it would not become ſo otherwiſe.——*8thly.* It doubles the crop on any ground, which I have had experience of.——*9thly.* You have (under Providence) the crops more within your power in *this*, than in any other method, let the ſeaſons turn out as they will.——*10thly.* You may have, on the ſame ground, a bean and a turnip crop annually, if the land be ſuitable, and you think proper.——*11thly.* The clay farmer by this mode renders land, which is naturally unfit for turnips, ſo free and open, by ſeaſonable horſe-hoeings, that it will bring that uſeful plant to great perfection.

[*By Mr.* THOMAS PAVIER.]

I will take the liberty to ſuppoſe a crop of beans *drilled in ſingle rows* at four feet diſtance, and the turnips, like Mr. Anderdon's, drilled in the intervals at a proper ſeaſon; in order to aſcertain the weight, there will then be four rows of ſeventeen feet in length to make a ſquare perch, whereas the length of Mr. Anderdon's was only fifteen feet eight inches. This, ſir, will make a difference in the weight of a perch from 230 to 249 pounds; and in the weight of an acre from 16 tons, 8 cwt. 2 qrs. 8 lbs. to 17 tons, 15 cwt. 2 qrs. 24 lbs.

Each turnip at this diſtance (viz. four feet from row to row, and nine inches in the rows) muſt occupy a ſpace of three ſquare feet, conſequently the greateſt number produced in an acre muſt be 14,520; but if ſown in broadcaſt, twice hoed, and the diſtance on an average 15 inches, each turnip will then occupy but little more than one foot and a half, and the number produced in an acre may be about 27,920, which (allowing them to be of the ſame magnitude) will weigh about thirty-four tons and four hundred weight. From hence there appears a manifeſt ſuperiority in favour of the broadcaſt and hand-hoeing; perhaps of more conſequence than the crop of beans (drilled as above) can reaſonably be expected to be worth.

Being almoſt an entire ſtranger to both theſe valuable modes of huſbandry, I can by no means pretend to aſcertain, with any tolerable degree of accuracy, the difference with reſpect to the expences: but am inclined to think, that the expence of drilling and horſe-hoeing the beans, together with drilling the turnips in the manner Mr. Anderdon did, muſt be conſiderably leſs than that of fallowing and preparing the ground, and ſowing the turnips in broadcaſt; to which may be added another advantage; namely, the facility of hoeing the drills, in compariſon of the broadcaſt.

There is one conſideration more in favour of drilling between the beans, which I muſt confeſs has conſiderable weight with me, viz. the great chance, if not an almoſt certainty, of preſerving the turnips from the depredations of the fly; for as Mr. Anderdon has had ſeveral ſuch crops without any damage of that kind, I ſuppoſe the beans to be almoſt a certain preventative.—*Feb.* 23*d*, 1784.

[*By Mr.* J. Bult, *of Kingston, near Taunton*]

In a field of ſix acres and a quarter, the ſoil a good clay, the beans were planted in drills near two feet apart, on two ploughings, and horſe-hoed three times, the turnips being ſown in the intervals at the third or laſt hoeing. There has been no kind of manure or dreſſing laid on the land for ſix crops paſt, nor is there any need of it, as I find by experience, that drilling and horſe-hoeing anſwer the end fully.

The weight of turnips was 37 tons, 5 cwt. per acre, as meaſured and weighed by Mr. Pavier, and Mr. Headford.

Theſe turnips are now feeding off. Thrty-one head of horned cattle, ſixty-ſeven ſheep, and twenty-ſix pigs have been maintained wholly by them for a month paſt; and what remains will keep them at leaſt a month longer. The expence of drawing and carting them into an adjacent field for the cattle is between 6s. and 7s. per acre.—*Dec.* 1785.

[*By* ARTHUR YOUNG, *esq.*]

Without hoeing, we ſhould get a produce on our beſt lands of, perhaps, two, three, or at moſt four tons on an acre, and that chiefly leaf. With hoeing, we get from 20 to 35 tons of root only; and if leaf were an object, much more than is ever gained without.

The hoeing not only thins the turnips, and makes them large, but it deſtroys all weeds that may have riſen in the field from the laſt ploughing; a ſecond hoeing repeats this; and in favourable ſeaſons a third may be given.

Some turnips were ſown in two feet intervals of drilled wheat, there was a good crop: and the turnips were only injured in ſome of the large leaves at harveſt. T. N.

[*By* J. D. *of H——n.*]

When ſheep are allowed as many turnips as they will eat, (which ſhould always be the caſe while they are fattening) they will on an average conſume near 20lbs. each, in 24 hours.

An acre of turnips twice hoed will, if the land be good, produce about 50 tons; which will, on the above calculation, maintain one hundred ſheep fifty-two days.

Turnip rooted cabbage will produce from 25 to 30 tons per acre; and for *ſpring-feed* are certainly the moſt valuable crop within the whole circle of huſbandry. They are invulnerable to froſt, either in or out of the ground.

Scotch cabbages, if they be the true flat-topt firm kind, are never affected by froſt, a few of the outſide leaves excepted. On land not worth more than 12s. per acre, I have had fifty-four tons per acre. An ox will in common eat about two hundred pounds in twenty-four hours.

A ſheep of twenty pounds a quarter will eat fifteen pounds of Scotch cabbages in twenty-four hours.

When cows and oxen are fed with cabbages, their dung is more in proportion than when fed with turnips, which go off more in urine; or than with hay, which is of too dry a ſubſtance.—*March* 1781.

A gentleman farmer, at Drayton, in Norfolk, ſuppoſes the turnip fly is cauſed by the freſh dung, and adviſes the manure to be laid on the preceding autumn.

To preſerve turnips from the fly, G. K. adviſes to put one ounce of brimſtone with a quart of ſeed into a bottle, and ſhake them together four or five days before ſowing.

A gentleman farmer in Eſſex adviſes to ſow four pints of ſeed to an acre, that there may be enough for the fly and to ſpare for a crop.

The Rev. Mr. Lamport was informed that the turnip plants raiſed from old ſeed, are leſs ſubject to be eaten by the fly than thoſe from new.

[*By Mr.* GULLET, *of Exeter*, 1782.]

About Midſummer, take the firſt opportunity when it rains, or there is an apparent certainty of rain approaching, to ſow your turnip ſeed, if about the full moon the better. In this caſe neither harrow, bruſh, nor roll, after ſowing, The natural heat of the ground at that ſeaſon, and the conſequent fermentation occaſioned by copious rain, will give an aſtoniſhingly quick vegetation to the ſeed, which in a few days will be up and out of all danger from the fly. At all events, ſow not till it rains; it is better to wait a month, or even longer, for rain, than to ſow (merely for the ſake of ſowing about the uſual time) when the ground is parched.

[*By the* SAME]

If the turnip ground be ſpaded and burnt, or the weeds, &c. burnt without ſpading, the fumigation thereby may ſuffice to chaſe ſuch of the inſect winged tribe from thence as are then there; but in all caſes, when the field is ploughed and ready for ſowing, let heaps be made at different places and intervals round by the hedges and boundaries of the turnip ground, and ſome few ſcattered through the field, in the ſame manner as directed for the orchards. Then, as ſoon as the ſeed is ſown, let the heaps on the *windward ſide*, and the ſcattered ones, be lighted and kept ſmothering during the continuance of wind in that quarter; the leſs the fire, and the more the ſmoke, the better. Should the wind happen to ſhift, thoſe heaps on the quarter it ſhifts to muſt then be lighted, and kept ſmothering in like manner. If the fly be kept from approaching the field, *the turnip crop is ſafe*—and few, I believe, will diſagree with me, that *prevention is better than remedy*.—*Nov.* 1786.

[*By* W. P. *of Suffolk.*]

The beſt method of preſerving turnips I have heard of, and which has been tried with ſucceſs by ſome of our beſt farmers, is to ſtack them up in dry ſtraw; a load of which is ſufficient to preſerve forty tons of turnips. The method is eaſy, and as follows:—After drawing your turnips in February, cut off the tops and tap-roots; then, on a layer of ſtraw next the ground, place a layer of turnips two feet thick, and then another layer of ſtraw; and ſo on alternately, till you have brought the heap to a point. Care muſt be taken to turn up the edges of the layers of ſtraw, to prevent the turnips from rolling out; cover the top well with long ſtraw, and it will ſerve as a thatch for the whole.

In this method, as the ſtraw imbibes the moiſture exhaled from the roots, all vegetation will be prevented, and the turnips will be nearly as good in May as when firſt drawn from the field. If ſtraw be ſcarce, old haulm or ſtubble will anſwer the ſame purpoſe.

But to prevent this trouble and expence, perhaps farmers in all counties would find it moſt to their intereſt, to adopt the method uſed by our neighbours the Norfolk farmers, which is, to continue ſowing turnips to the latter end of Auguſt; by which means their late crops remain good in the field till the latter end of April, and often till the middle of May.——*March* 1780.

END OF THE FIRST VOLUME.

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